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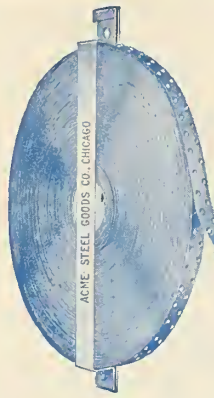


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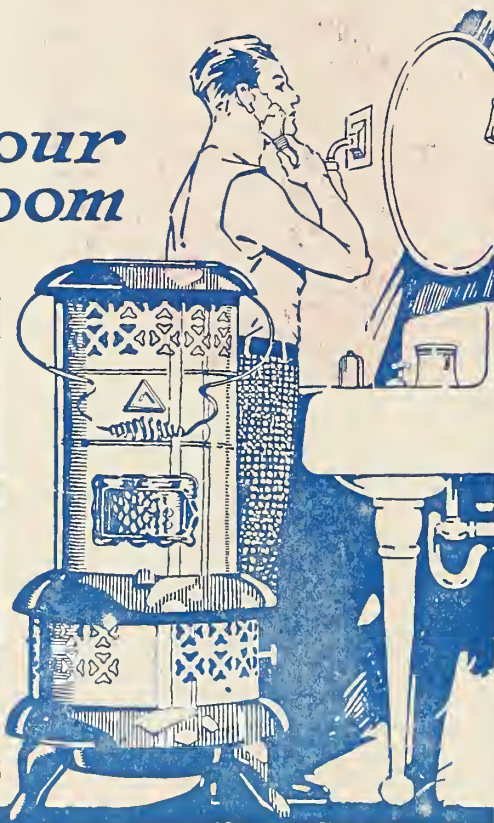


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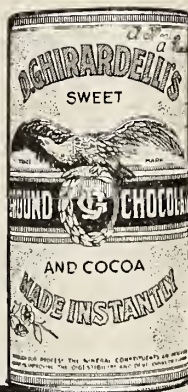
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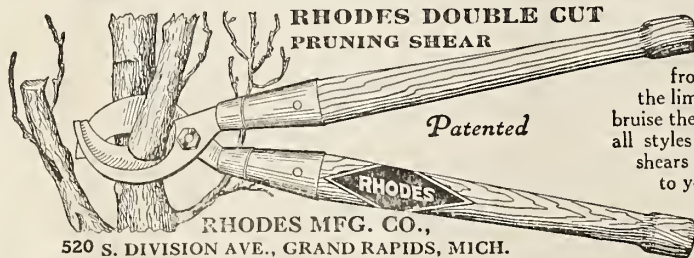


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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Pruning for Size

By V. R. Gardner, of Experiment Station, Corvallis, Oregon—Address Delivered at Fruit Growers' Conference, Tenth National Apple Show, Spokane

THE intelligent fruit grower is interested not only in what constitutes good orchard practice,—not only in what are the various operations that should be performed, the things that should be done, and in how and when they should be done,—but he is interested also in how these practices operate, in how each and every one of them influences the growth of the tree itself and the development of its fruit. At least this is the attitude of the modern scientific fruit grower—the one who regards his work as something more than simply a trade. If the question under consideration is that of irrigation he is not satisfied simply with a knowledge of how frequent and how heavy applications are required for his conditions, but he is interested in the role that water plays in the normal functioning of the tree and in the normal development of its fruit, in the minimum as well as the optimum water requirements of the plant, and in many other related questions. It is only as he possesses this general, and at the same time specific, information regarding his various orchard practices that he is able intelligently to modify them to meet emergencies. That the grower today really is interested in these more serious, more scientific, phases of orchard management, is evidenced by the demands that continually are being made upon college experiment station men for information upon such subjects as the one announced as the topic of this article, "Pruning for Size." It is true that there is still a great demand for empirical knowledge,—as rules for pruning, formulae for fertilizers, definite spraying calendars; and information of this type will probably continue to be of great use. Today the demand is for a pruning method or pruning system that will increase size; tomorrow it may be for a method that will heighten color; still later it may be for a method that will help control fruit pit or rosette. It is well that this information be made available in the form of rules or directions if it is to be had. It is better if there comes to be a more general understanding of growth processes and of the ways in which they may be controlled or modified. With these general considerations in mind let us make a somewhat careful analysis of pruning practice to see in what way or ways it most directly affects the growth of the tree and the development of its fruit. Incidentally we shall see whether it directly or indirectly influences size.

In the first place it may be well to call attention to the fact that, broadly speaking, the object of any and all of

the orchard operations is: (1) to increase yield, (2) to improve quality or grade, (3) to lower cost of production. It is evident that certain orchard operations contribute almost exclusively to a single one of these general objects. For instance, orchard heating is practiced not to lower cost of production, nor to increase the grade of fruit, but primarily to increase yield—or at least to make yields more certain. On the other hand, certain other orchard operations contribute to the realization of two or more of these general objects of all orchard practice. Irrigation is plainly not employed to lower cost of production, but in the first place to improve grade through increasing size, and in the second place to increase total yield. Now the question arises, "Is pruning a practice whose aim is mainly to lower production costs, to increase yield, or to improve grades?" Increase in size is apt to involve some increase in yield, but primarily it effects an improvement in grade; hence we are mainly interested in the way in which pruning may help us attain that general object.

There is little, if any, doubt as to the available water supply in the soil being the factor most directly bearing upon the proper sizing of fruit. The apple averages about 85 per cent water in composition, and this, coupled with the fact that water is found in the soil in the same form as in the fruit, would lead us to assume that there is a very direct relation between the factors of soil moisture and fruit size. That there is a close correlation between water supply and size not only of fruit but of other plant parts as well, is taught by plant physiology. Furthermore, tillage and irrigation practice for centuries furnishes an abundance of evidence upon the subject. If, then, available water supply is the most important factor influencing size, the question may now be raised as to how, if at all, pruning affects the available water supply. Obviously it cannot influence appreciably the water supply in the soil. Can it then affect the water supply available for particular fruits on the tree? It is evident that pruning may result in a thinning of the crop through the removal of more or less bearing wood. This would automatically make available for the rest of the tree a relatively larger water supply and at least theoretically contribute to increased size on the part of that which remains. However, this assumes that the intake of the roots would not be reduced by the removal of a part of the top and also that the remaining vegetative portions of the tree would not have an increased water requirement.

But these are two assumptions that may not be warranted. Evidence on the first assumption is limited, but we are not without evidence on the second. Under normal conditions the leaves use much more water than the fruit. Pruning that would materially thin the fruit crop through a reduction in bearing wood would also tend to stimulate an increased vegetative growth that in turn would make still further demands upon the water supply available to the tree. It is easily conceivable that this greater leaf surface might more than counterbalance in its water demands the amount theoretically released to remaining fruits through a removal of a part of the bearing surface. Exact evidence on this question is limited in amount, but it is sufficient to warrant questioning the practicability of employing pruning as a means thus indirectly to improve size. At least it is uncertain to what extent pruning is efficient in diverting water from a large number of fruits to a smaller number on the same tree. Experimental results obtained at the Missouri Experiment Station indicate that medium late or late-summer pruning that removes vegetative growth (leaves and shoots) only may be a means of diverting a larger proportion of the total water intake to the developing fruits and thus directly aiding in their sizing; but even in that case it is seriously questioned if such a pruning practice accomplishes enough to be really practicable.

Another factor of probable importance in determining size of fruit is the available food supply in the soil. This can be of influence only indirectly, as the mineral foods of the soil cannot enter into the composition of the fruit at once, but first must be manufactured into elaborated foods (starches, sugars, proteins, acids, etc.). Obviously again, pruning cannot modify the supply of food in the soil and probably only to a limited extent the intake of food by the roots. To the extent that pruning thins the crop through reducing the bearing surface, it makes available, theoretically, a larger supply of raw food for each developing fruit. But since this raw food first must be worked over into elaborated foods before the fruit can store and use it, it is necessary to consider the influence of pruning upon leaf surface and leaf activity. These are influences about which comparatively little is known at the present time. Some types of pruning result in an increase in leaf surface, others result in a decrease. Whether or not there are corresponding increases and decreases in the manufacture of starches, sugars,

proteins, etc., that go into the fruit is not known. In other words, while pruning may be, and probably is, a means of indirectly modifying the food supply available to individual fruits on the tree, we do not know at the present time in what way or ways different pruning practices act in this respect. This is a question, or rather a series of questions, upon which evidence is badly needed. In the meantime, it is unsafe to make any specific recommendations for the influencing of food supply of fruit through special pruning practices.

Mention has been made of the fact that pruning is often a means of thinning the fruit through reducing bearing area. Thinning itself is an operation performed especially with the object in view of increasing size. Therefore it would seem that pruning would in this way lead to an increase in size—presumably the same increase in size that would be effected by an equally severe fruit thinning. However, a more careful study of the question leads to the belief that such an assumption is hardly warranted. A pruning that effects, we will say, a 50 per cent thinning of the fruit crop, likewise causes a very material reduction in leaf area, and probably a very material (though not necessarily the same) reduction in elaborated food that is available for the development of the fruit. Thus it would seem that thinning of fruit by means of pruning would tend to increase size through indirectly increasing the water supply of the fruits that remain and at the same time would tend to decrease to a certain extent their available food supply, and hence their size. Probably the first tendency would much more than outweigh the second; but it is evident that the ultimate effect of pruning upon size of fruit is uncertain; and quite opposite results might be obtained from different kinds or degrees or seasons of pruning.

There is another, and very important, question to be taken into consideration in this connection. Pruning will effect an increase in size of fruit only as it reduces the present (or future) bearing area. This means a more or less permanent loss to the tree—perhaps impairing productiveness for many years to come. Few growers would care to sacrifice the prospect of future crops in order slightly to improve the marketable grades of the current season. Whatever the orchard practice involved, any far-seeing policy considers very carefully the permanent welfare of the tree. This is not stating that increase in size of fruit is not or cannot be effected by certain pruning practices. Almost any pruning practice materially altering either the form or functions of the tree as a whole or of its parts is almost certain in some way to modify size of fruit. The point to emphasize is that such influences are indirect rather than direct and relatively small rather than relatively large. Furthermore, they are uncertain—that is, our present knowledge of pruning practices and of the responses that trees make to them does not warrant making specific recommendations for “pruning

for size.” We cannot say that a certain kind or a certain amount of pruning will be followed by a certain increase in size. Size of fruit is much more directly under control of the grower through tillage, cover crop, fertilization, irrigation and thinning practices.

What, then, it may be asked, is the role of pruning as an orchard practice? If it is not a certain means of contributing to the sizing of the fruit, is it to be regarded mainly as a means of increasing number of fruit and perhaps also as a means of lowering cost of production. In other words, what are the fundamental reasons for pruning? What object or objects may the grower confidently expect to realize through pruning?

A careful study of the whole question would seem to indicate that its first and foremost object is to provide year after year for a heavy crop of blossoms. Before fruit can develop flowers must be produced, and before there are flowers there must be fruit buds. Probably no cultural practice affords such a direct means of influencing fruit and fruit-spur formation as pruning. It is possible so to prune trees that there will be relatively few fruit spurs and fruit buds. It is likewise possible so to prune them that there will be many strong, vigorous spurs and an abundant annual production of fruit buds. This does not mean necessarily that there will be heavy crops annually, for frost, insect or fungus attack, etc., may serve to ruin occasional crops and a failure otherwise to properly care for the orchard may tend to bring about alternate fruitful and unfruitful conditions in the tree. But with good care in other respects pruning is an efficient means of regulating the number of fruit buds produced.

Of course, it would be possible so to prune as each year to provide for only a limited number of fruit buds and fruit and thus indirectly aid in sizing. Within certain limits this is to be regarded as good practice; but it would seem the part of greater wisdom so to prune as always to insure a supply of fruit buds considerably in excess of that actually needed so as more nearly to insure a good crop even in the face of conditions unfavorable for fruit setting. Other orchard practices, such as thinning of fruit, can then be depended upon to reduce numbers when necessary, and still other practices such as cultivation and irrigation can be depended upon to take care of size.

It should not be inferred from what has been said that because pruning is not a very reliable means of increasing size, it is not a means of improving grades. Color is an even more important factor than size in determining the grade of apples. While the red colors apparently are dependent upon sunlight more than upon other factors, pruning affords us our best means of withholding light from, or admitting it to, the ripening fruit.

There are other indirect ways in which pruning contributes to improved grades. It should be a means of opening up the tree so as to render possible

more efficient spraying, thus reducing scab and other infection. It should practically insure against limb rub. Furthermore, pruning is one of our most efficient means of lowering production costs. This it does mainly through rendering easier many orchard operations, such as thinning, spraying, cultivating, harvesting. These, however, are to be regarded more as incidental or secondary objects of pruning rather than primary objects.

It is realized that this may be considered a rather peculiar way to treat such a topic as that announced on the program—“Pruning for Size.” We generally look for suggestions as to what may, rather than what may not, be accomplished. But whenever a condition arises like that presented this last season—a large percentage of the fruit running in the small sizes—there is at once a demand for information relating to the bearing of each and every orchard practice upon its treatment or correction. To find out that improvement is not to be sought through some particular practice is really of nearly as much use as to find that it is to be sought through some other practice. It is well that the grower study carefully each of his orchard operations in their relation to the various functions of the tree, for only by so doing can he more nearly approach the ideal in orchard management. If the discussion which this article arouses will lead to a better understanding of the true role of pruning in orchard practice, its object will have been realized.

Storing Vegetables.

By storing, it is comparatively easy to keep such vegetables as beets, carrots, cabbage, celery, dry beans, dry lima beans, onions, parsnips, potatoes, sweet potatoes. With the exception of beans and turnips, these crops may be stored in the cellar, in pits or banks, or in caves and outdoor cellars. Pits or banks should be made in a well-drained location. A shallow excavation some 8 or 10 inches deep and of suitable size, should be made. This is lined with straw or leaves and the vegetables placed in a conical pile on this material. The vegetables are then covered with straw and then earth, the depth depending upon the severity of the winter. The pits may be covered with additional straw, corn stover or manure during very severe weather. The outdoor cellar or cave is even more satisfactory but the entailed expense is greater. Beans may be kept in any dry place such as the attic or pantry. Now is the time of the year to care for these crops so that they may be made available during the winter and early spring.

“Eat less candy; the allies need the sugar,” says the Food Administration. “All right,” our patriotic farm boys and girls are saying; “nuts and popcorn are better, anyway.”

Tool sheds haven't risen in price nearly so fast as farm machinery.

Distribution of the Famous Northwest Apple

455 Towns Shipped November 1-24, 1916—550 Towns Shipped November 1-22, 1917
95 Towns More—over 20% Increase—in 22 Days in November, 1917

IN the December, 1916, issue of BETTER FRUIT we published a list of towns to which shipments were made in carloads from the Northwest from November 1 to 24, inclusive. The number of towns reported shipped to was 455. In this issue we publish a list of towns receiving Northwestern apples in carlots direct from the Northwest, showing 550 towns, which shows the excellent and wonderful results achieved by increasing the number of towns receiving Northwestern apples in carlots. The period is for two days less. However, 95 more towns have been shipped direct—over 20 per cent increase. However, the list does not show the full amount of increase, for the reason that apparently a greater number of carloads have gone to diversion points this year than in previous years. It is hoped and believed that the list of towns shipped will afford the fruit growers and shipping concerns some valuable information. On the 1916 crop 611 towns were reported as shipped direct for approximately two months. Your particular attention is called to the fact that in 22 days in 1917, 550 towns have been shipped, which shows a mighty good record and wonderful improvement.

The Editor of BETTER FRUIT has been preaching wider distribution of the apple crop for many years. A pretty good effort was made last year, and the increased activity on the part of the shipping concerns, and the splendid results, are already a matter of record. In two months of 1916 611 towns were shipped apples in carlots direct from the Northwest. In 22 days during the month of November 550 towns were shipped direct. In connection with this statement it must be borne in mind that apparently a great many more apples were shipped to diversion points this year than last. The Editor feels very much gratified over the results, firmly believing that every fruit grower and shipper in the Northwest will feel a great degree of satisfaction over the remarkable improvement in the increased distribution. The list of towns shipped is published elsewhere in this edition and is worthy of consideration, thought and careful study.

The sales managers of every concern and many fruit growers can study the list with much profit. If the sales managers will give the matter still further attention, checking up in the Produce Reporter or some other directory the list of towns that have been sold and studying those not sold, making a special effort to connect up with the towns not sold and endeavor to do business in them, the distribution can further be increased this season and undoubtedly will be.

In conclusion, the Editor wishes to express his gratification over the splendid results achieved and to convey his thanks to every sales manager of the Northwest for the splendid efforts made, and equally important with this

are the good prices being realized and the splendid increase in prices over last year.

Aberdeen, S. D. 14
Akron, Ohio 3
Altus, Okla. 1
Anaconda, Mont. 4
Agra, Okla. 3
Alberta, Canada. 1
Aldersyde, Canada. 1
Amer. Lake, Wn. 1
Anderson, Tex. 1
Arkansas City, Ok. 1
Alexandria, Minn. 6
Abelind, Kan. 1
Alger, Wyo. 3
Alliance, Neb. 1
Almont, N. D. 1
Amcr. Falls, Ida. 2
Almena, Kan. 1
Atlanta, Ga. 3
Ashtabula, Ohio. 3
Astoria, Oregon. 1
Ardmore, Okla. 1
Albion, Neb. 1
Alder, Minn. 1
Ann Arbor, Mich. 1
Armour, Neb. 1
Aurora, Ill. 1
Baker, Oregon. 1
Bellefourche, S. D. 2
Bellingham, Wash. 2
Billings, Mont. 33
Birmingham, Ala. 7
Boston, Mass. 28
Bridgeport, Conn. 7
Baltimore, Md. 16
Bismarck, N. D. 19
Buffalo, N. Y. 13
Burlington, Ia. 2
Butte, Mont. 23
Bayfield, Wash. 1
Beaumont, Tex. 7
Benedict, Kan. 2
Blue Island, Ill. 2
Brandon, Canada. 7
Buffalo, Wyo. 1
Bloomington, Ill. 3
Bottineau, N. D. 1
Battleford, Canada. 1
Beilash, Wash. 1
Bakersfield, Cal. 1
Brookings, S. D. 1
Brenhan, Tex. 1
Brainerd, Minn. 4
Beaver City, Neb. 1
Beatrice, Neb. 1
Ballard, Wash. 1
Byrum, Tex. 1
Burley, Idaho. 2
Buffalo Sp'gs, N.D. 1
Brownwood, Tex. 3
Broadhead, Wis. 1
Bisbee, Ariz. 3
Bozeman, Mont. 2
Bedford, Oregon. 1
Brantford, N. D. 1
Bowman, S. D. 2
Bellefontaine, Ohio. 1
Brookings, S. D. 2
Bluefield, W. Va. 1
Bancroft, Wis. 1
Brush, Col. 1
Basin, Mont. 1
Berlin, Wash. 1
Bison, Mont. 1
Camoose, Canada. 2
Canada, Kan. 5
Casper, Wyo. 6
Charlestown, S. C. 2
Cheney, Wyo. 119
Chicago, Ill. 449
Cleveland, Ohio. 27
Crawford, Neb. 7
Columbus, Ohio. 10
Cresco, N. M. 1
Cutbank, Mont. 22
Chateau, Mont. 1
Calgary, Canada. 14
Cincinnati, Ohio. 11
Crete, Neb. 1
Corbush, N. D. 1
Cozad, Neb. 1
Carlton Sta., Mich. 1
Creston, Wash. 1
Chadron, Neb. 1
Centralia, Wash. 1
Canby, Minn. 1
Correctionville, Ia. 1
Cody, Wyo. 1
Clayton 1
Clarendon, Tex. 1
Centerville, Ia. 1
Carlton Sta., N. Y. 3
Corsicana, Tex. 1
Canda, N. D. 1
Champaign, Ill. 1
Cascade, Mont. 1
Cedar Rapids, Ia. 3
Council Bluffs, Ia. 2
Chippewa Falls, Wis. 2

Charlestown, W. V. 1
Coffeyville, Kan. 1
Central City 2
Council Bluffs, Ia. 2
Cereel, Canada. 1
Comanche, Okla. 1
Chattanooga, Tenn. 1
Dallas, Tex. 19
Dayton, Kan. 1
Decatur, Ill. 2
Denver, Col. 146
Des Moines, Ia. 18
Detroit, Mich. 29
Duluth, Minn. 29
Davenport, Iowa. 13
Danville, Ill. 3
Dodge City, Kan. 6
Dickenson, N. D. 5
Dundee, Minn. 1
Deadwood, S. D. 5
Drum Centre, Ky. 1
Deming, N. M. 1
Douglas, Ariz. 2
Dayton, Ohio. 2
Drake, N. D. 1
Devils Lake, N. D. 1
Dauphen, Canada. 1
Dillon, Mont. 1
Elmira, N. Y. 71
El Paso, Tex. 12
Everett, Wash. 13
Enia, Okla. 11
Ely, Minn. 1
Ellano, Tex. 1
Easterhazy 1
Elkhorn, Wash. 1
Ely, Minn. 1
Ellsworth, Minn. 1
Estuary, Canada. 1
Evansville, Ind. 1
Euchant, Canada. 1
Edmonton, Canada. 1
Eau Claire, Wis. 1
Euphrata, Wash. 2
Fargo, N. D. 29
Farrell, Mont. 1
Forsyth, Mont. 2
Fort Worth, Tex. 24
Frazier, Mont. 1
Farrell, Pa. 2
Fairfield, Wash. 2
Fort Clark, N. D. 1
Freeport, Ill. 1
Fort Wayne, Ind. 3
Fresno, Cal. 2
Faulkirk, Pa. 1
Federal, Ill. 1
Fremont, Neb. 2
Fullerton, N. D. 1
Fort Smith, Ark. 1
Five Points, Utah. 1
Fairfield, Neb. 1
Faith, S. D. 1
Florence, S. D. 1
Forestburg, S. D. 1
Faulkstone, S. D. 2
Fowler, Ind. 1
Graybull, Wyo. 1
Grand Forks, N.D. 1
Granger, Wyo. 1
Great Falls, Mont. 16
Golden Valley, N.D. 1
Great Forks, N. D. 3
Grand Jct., Col. 1
Grimsley, Canada. 2
Grand Island, Neb. 10
Grand Jct., Idaho. 4
Graceville, Minn. 1
Geneva, N. Y. 1
Galveston, Tex. 1
Globe, Ariz. 3
Graton, S. D. 1
Graham, Wash. 1
Galveston, Tex. 1
Glenrock, Wyo. 1
Granville, N. D. 1
Heltlinger, N. D. 1
Hood River, Oregon. 7
Houston, Tex. 22
Hilton, N. Y. 5
Huron, N. D. 2
Humphrey, Neb. 1
Hartford, Conn. 2
Helena, Mont. 5
Henderson, Mont. 1
Hanna, S. D. 1
Hillsdale, Wyo. 1
Heaton, N. D. 1
Hurdfield, N. D. 1
Hutchinson, Kan. 1
Hamilton, Canada. 1
Havana, Cuba. 1
Henryetta, Okla. 1
Harden, Mont. 1
Hoxie, Ark. 1
Hailey, Idaho. 1
Hastings, Neb. 3
Heglar, Idaho. 1

Hinton, W. Va. 1
Hugo, Wash. 1
Huntington, W. V. 1
Indianapolis, Ind. 6
Idaho Grove, Ia. 1
Indian, Wash. 1
Independence, Kan. 2
Ithaca, N. Y. 1
Jamestown, N. D. 6
Joliet, Ill. 1
Judith Gap, Mont. 1
Jacksonville, Fla. 1
Jackson, Mich. 3
Knoxville, Tenn. 3
Kansas City, Mo. 48
Keene, N. H. 3
Klamath Falls, Or. 4
Kimmerer, Wyo. 2
Kildeer, N. D. 1
Kerrol, Canada. 1
Kinsail, N. D. 1
Kulm, N. D. 1
Keokuk, Ia. 1
Kimberly, Idaho. 1
Kingston, Idaho. 1
Laramie, Wyo. 2
Lemmon, S. D. 8
LeRoy, N. Y. 88
Lewiston, Mont. 4
Livingstone, Mont. 4
Los Angeles, Cal. 57
Lake Charles, La. 1
Lethbridge, Can. 2
Lincoln, Neb. 17
Louisville, Ky. 16
Letcher, S. D. 1
Leonard, N. D. 1
Lerado, Tex. 2
Long Prairie, Minn. 1
Laurel, Mont. 8
Lead, S. D. 1
Lavina, Mont. 1
Lawton, Okla. 1
Lima, Ohio. 1
Laurel, Miss. 2
Lake Preston, S. D. 1
Las Animas, Col. 1
London, Ont. 2
Liberal, Kan. 1
Long Island, N. Y. 2
Lakeview, Ohio. 1
Median, N. Y. 9
Meridian, Idaho. 17
Milwaukee, Wis. 30
Minneapolis, Minn. 30
Manhattan, Kan. 1
Minot, N. D. 32
Malvern, Ia. 8
Moline, Ill. 2
Moosejaw, Canada. 21
Marysville, Kan. 1
Manchester, Mont. 1
Missoula, Mont. 3
Muskogee, Okla. 5
Marion, Ohio. 2
Marshall, Minn. 1
Mpls Trans., Minn. 3
Moorecraft, Wyo. 1
Middlesboro, Mass. 1
Montpelier, Idaho. 1
Marshfield, Wash. 1
Mabscott, W. Va. 1
Montgomery 1
Moccasin, Mont. 1
Milner, N. D. 1
Memphis, Tenn. 2
Marysville, Wash. 1
Miles City, Mont. 1
Mafta, Mont. 1
Montreal, Canada. 2
Murphysboro, Ill. 1
Merican, Idaho. 2
Moulton, Ia. 1
Malvern, N. Y. 2
Monitor, Wash. 1
Mott, N. D. 1
Mitchell, S. D. 3
Marion, Ia. 1
Miles City, Mont. 2
Murray, N. D. 1
McAllister, N. D. 1
Mandan, N. D. 1
Montpelier, Minn. 1
Minden, Neb. 1
Mongolia City, Pa. 1
Muscatine, Ia. 1
Marshalltown, Ia. 1
Mason City, Ia. 1
New York 309
North Platte, Neb. 60
Nashville, Tenn. 13
Nekoma 1
Nampa, Idaho. 4
New Castle, Wyo. 2
New Salem, N. D. 2
New Orleans, La. 7
Norcator, Kan. 1
New Rockford 2
New Battlefd, Can. 1
Northwood, N. D. 1
Newberg, Oregon. 5
N. Battleford 2
Nacogdoches, Tex. 1
New England 1
Newberg, N. D. 2
Nevada, Mo. 1
Norris, Mont. 1
New Haven, Conn. 1
Olympia, Wash. 1
Omaha, Neb. 218
Ogden, Utah. 4
Oklahoma City ... 3
Oshkosh, Wis. 1
Ottumwa, Ia. 1
Okmulgee, Okla. 1
Oakland, Cal. 20
Owatonna, Minn. 1
Oakley, Kan. 1
Orrville, Ohio. 1
Orland, Cal. 2
Osceola, Ia. 1
Oronago, Kan. 1
Ottawa, Canada. 1
Owensboro, Ky. 1
Osnabrack, N. D. 1
Occan Park, Wash. 1
Odcssa, Wash. 1
Pittsfield, Mass. 1
Pecos, Tex. 1
Prussia, Canada. 1
Peoria, Ill. 3
Pensacola, Fla. 2
Poplar, Mont. 2
Pocatello, Idaho. 8
Pueblo, Col. 1
Palestine, Tex. 1
Paris, Ill. 1
Pasadena, Cal. 1
Pr. Albert, Canada. 4
Puyallup, Wash. 1
Payette, Idaho. 5
Parkers Prairie. 1
Parker, S. D. 2
Parkston, S. D. 1
Phoenix, Ariz. 3
Pittsburgh, Pa. 54
Portal, N. D. 10
Portland, Oregon. 61
Philadelphia, Pa. 60
Peterborough, Can. 1
Palisade, Wash. 2
Pig La Prairie, Can. 1
Pipestone, Minn. 2
Prelate, Canada. 1
Providence, R. I. 9
Roundup, Mont. 1
Rawlins, Wyo. 2
Roy, Mont. 1
Regina, Canada. 15
Rochester, N. Y. 1
Red Lodge, Mont. 3
Rock Sp'gs, Wyo. 7
Raymond, S. D. 2
Rapid City, S. D. 4
Radcliffe, Ia. 1
Ritzville, Wash. 1
Rockford, Ill. 2
Russell, Canada. 1
Reed Point, Mont. 1
Riverton, Wyo. 1
Ramsen, Iowa. 2
Rochester, N. Y. 1
Rock Valley, La. 1
Red Deer, Canada. 1
Rock Island, Ill. 1
Roston, Wash. 1
Quinter, Kan. 1
St. Louis, Mo. 106
St. Paul, Minn. 57
Sacramento, Cal. 23
Salt Lake City, Ut. 16
San Antonio, Tex. 20
San Diego, Cal. 7
San Francisco, Cal. 56
Saskatoon, Canada. 7
Seattle, Wash. 121
Shreveport, La. 13
Sioux City, Ia. 28
Sioux Falls, S. D. 9
Spokane, Wash. 105
Streator, Ill. 1
Sunnyside, Wash. 1
Susp. Bridge, N. Y. 74
Swift Current, Can. 3
Sheridan, Wyo. 5
Sweetwater, Wash. 1
Stockton, Cal. 1
South Bend, Wash. 1
Stettler 1
Soda Springs, Ida. 1
Shawnee, Okla. 1
Sulphur Spr., Tex. 1
Superior, Wis. 1
Sykeston, N. D. 1
Seeword, Neb. 1
Sumus, Mont. 1
San Bernardino, Cal. 1
Salesville, Mont. 1
Superior, Wis. 2
Sepeter 1
Scotts Bluff, Ia. 2
Santa Barbara, Cal. 1
San Marcus, Tex. 2
Stockton, Kan. 1
Sidney, Neb. 1
San Jose, Cal. 1
Saco, Mont. 1
Sumner, Wash. 7
Shepherd, N. D. 1
Starkwater, N. D. 1
Sykeston, N. D. 1
Stanley, N. D. 1
Shelby, Mont. 6
Selah, Wash. 1
St. Cloud, Minn. 4
San Angelo, Tex. 2
St. Marie, Idaho. 1
Sheboygan, Wis. 1
Sherbrook, Canada. 1
Spearville, Kan. 1
Springfield, Ill. 12
Springfield, Mass. 1

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sible after it is harvested. The warehousemen should then hold the fruit at as low a temperature as possible without subjecting it to the danger of freezing and should carefully watch it so that it may be disposed of while in good condition.

The factors making for successful storage are discussed in detail in Department Bulletin No. 587, "Storage of Apples in the Pacific Northwest," recently published by the United States Department of Agriculture.

It was found in the investigations, in regard to the factor of health and soundness, that apples from orchards badly infected with Northwestern anthracnose are likely to decay early in their storage life, and that well colored portions of the skins of apples seldom if ever develop scald. These facts indicate the desirability of proper care of the orchards, including spraying and pruning. Keeping the trees open by pruning will admit the sunlight more freely and so facilitate coloring. The fact that scald develops generally on uncolored portions of the apple emphasizes the importance of allowing fruit to develop high color before it is picked for storage. Only gross negligence on the part of the shipper or warehouseman can nullify the effect of good color and sanitary orchard practices, the specialists point out. On the other hand, if fruit is poorly grown or diseased, the utmost care on the part of the warehouseman cannot prevent the development of storage troubles.

Apples were stored under similar conditions when picked immature, mature and overmature. In all cases the apples picked at maturity kept best. The best degree of maturity, it was found, was somewhat short of eating ripeness.

The importance of keeping the skins of apples unbroken was demonstrated. Every bruise and scratch furnishes a possible point of entrance for fungous organisms causing decay.

The promptness with which the fruit is stored and cooled after it is picked is the most important single factor in retarding natural decay, it was found. The more or less common practice of permitting the fruit to remain out of storage for several days in the orchard or packing house may shorten its cold storage life considerably, especially if the weather is warm. In the experiments, apples stored immediately kept in good condition in storage one month longer than apples held two weeks in packing houses before storage.

In the temperature experiments, some apples were held at 31 to 32 degrees F., and others at 35 to 36 degrees F. In all these experiments the fruit held at 32 degrees was in better condition and could be held through a longer storage period than that held at the higher temperature. The practical effect of the higher temperature was the same as that of delay before storage. The life activities of the fruit advanced with greater rapidity than that stored at 32 degrees, and all fruit taken out of storage from time to time was found to be duller, yellower and riper than that held at 32 degrees. Thirty-two degrees

Syracuse, N. Y....	5	Tremonton, Can... 2	Wahpeton, N. D... 4	Wheatland, N. D... 1
Stanton, N. D....	1	Terry, Mont.	1	Wilwood, Canada. 1
Stearnsville, Wash. 1		Thief River Falls. 1	Wallula, Wash....	1
Stockton, Cal....	3	Three Forks, Mont. 1	Whitefish, Mont... 57	Wichita Falls, Tex. 1
Texarkana, Tex... 4		Tyler, Minn.	1	Winnipeg, Canada. 15
Toppenish, Wash. 6		Tueson, Ariz.	1	Wilson, N. Y..... 12
Tacoma, Wash.... 13		Thompkins, Can... 1	Waldram, Kan....	1
Toronto, Canada.. 19		Thompson, Can... 1	Weatherford, Tex. 1	Waco, Tex. 10
Trinidad, Col. ... 5		Temple, Ariz. 2	W. Somerset, N. Y. 2	Ware, Mass.... 5
Tulsa, Okla. 16		Terrell, Tex. 1	Weyburn, Canada. 9	Wallace, Idaho... 2
Topeka, Kan. 2		Townsend, Mont.. 1	Whitewater, Wis.. 1	Walla Walla, Wn. 2
Tyler, Wash. 1		Utica, N. Y..... 2	Wileott, N. D....	1
The Dalles, Oregon 18		Vancouver, Can... 10	Whitethorpe, Can. 2	Washington, D. C. 25
Tyler, Tex. 8		Vermillion, S. D.. 1	Wallace, N. D....	1
Toledo, Ohio 1		Vern, Okla. 1	Wahoo, Neb.	1
Trair, Ia. 1		Valley City, N. D. 3	Wamego, Kan....	1
Terry, Mont. 1		Vetrain, Canada.. 1	White River Sp'gs. 1	White, S. D.... 1
Toledo, Ohio 1		Vancouver, Wash. 10	Wehlen 1	Yakima, Wash.... 73
Twin Falls, Idaho 1		Volga, S. D.... 1	Winfield, La.	1
Turtle Lake, N. D. 3		Watertown, S. D.. 2	Willmar, Minn....	1
Twin Bridges, Mt. 1		Warm Sp'gs, Mont. 1	Wolfpoint, Mont.. 1	Yellow Grass 1
Tiffin, Ohio 1		Waterloo, Ia.	Winfield, Kan....	1
Trenton, N. J.... 2		Wellsville, N. Y.. 1	Wynne, Ark.	1
Taft, Mont. 1		Wichita, Kan.... 1		Zillah, Wash.... 12
		Weiser, Idaho 1		Zanesville, Ohio.. 3

Cold Storage of Apples in Pacific Northwest

More Satisfactory Keeping of Fruit Discussed by Specialists of U. S. Department of Agriculture

THAT the responsibility for the keeping qualities of Northwestern apples must be shared practically equally between growers and handling organizations on the one hand, and cold storage warehousemen on the other, is the conclusion reached by specialists of the United States Department of Agriculture as a result of investigations to determine the factors of greatest importance in successful storage of the fruit.

The investigations disclosed that if the fruit is to be stored most satisfac-

torily, and is to be got into the hands of the consumer in excellent condition, the grower's part should be, first, to produce the healthiest possible fruit, sound, well colored and free from decay or skin blemish; and second, to have it carefully harvested at just the proper degree of maturity. The handler's part should be to so handle the fruit in harvesting, hauling, grading and packing that it will not be bruised, scratched or injured. Growers, shippers and warehousemen should co-operate to get the fruit into cold storage as soon as pos-

Total number of towns supplied 550.
Total number of ears 4,280.

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4. They will not freeze at ordinary temperatures.
5. Thousands of farmers state that the Giant brands "give better results"—"save money"—"have wider breaking power"—"shoot the roots"—and "are always uniform in action."

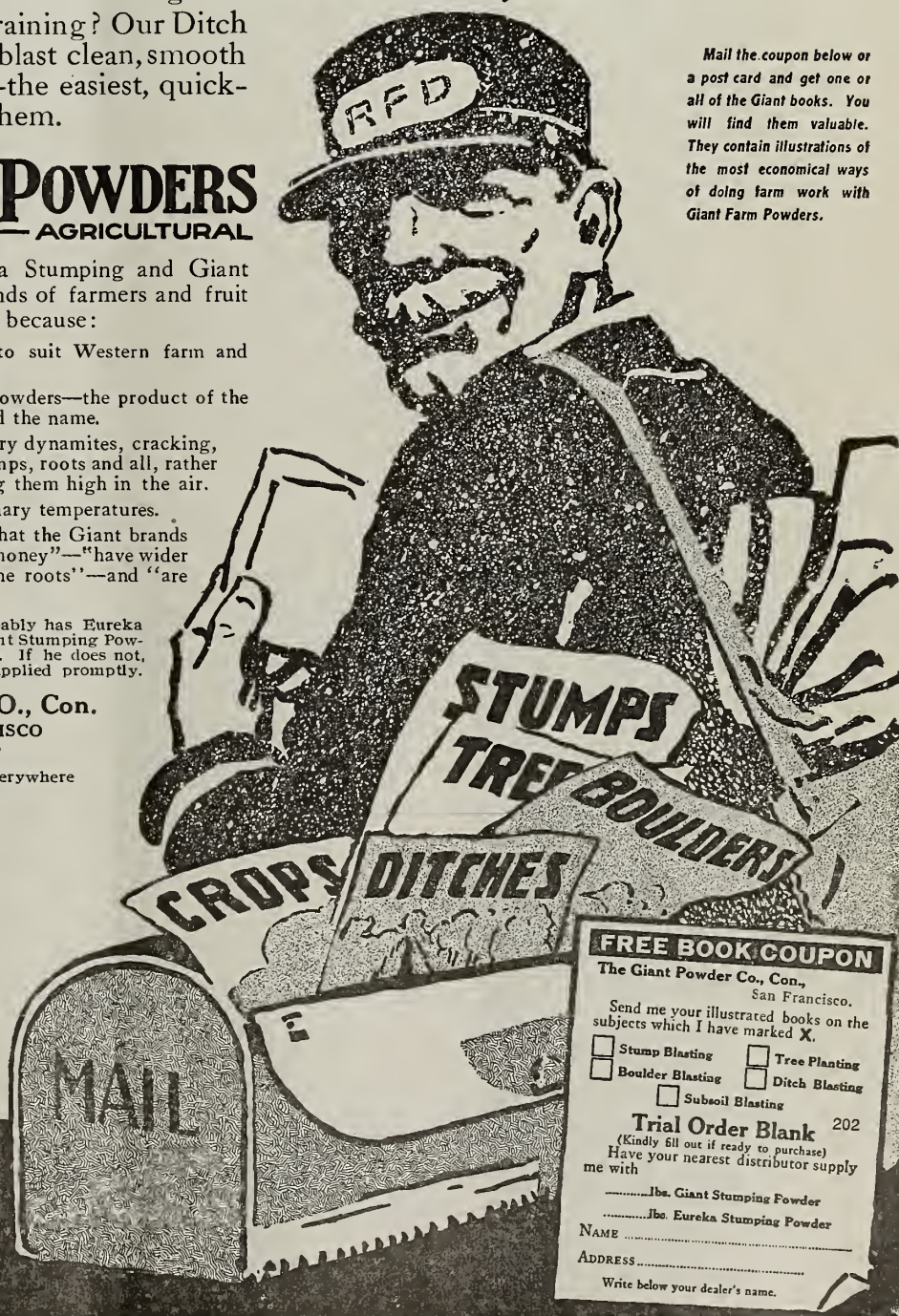
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|---|---|
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| <input type="checkbox"/> Boulder Blasting | <input type="checkbox"/> Ditch Blasting |
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was found to be a safe temperature, since the freezing point of apple juice is several degrees lower.

The experiments showed the Rainier apple to be the best keeping variety. It remained in prime condition for market until May or later. In length of time in which they could be kept in such condition the remaining varieties tested ranked as follows: Hyde King and Arkansas Black, May; Winesap and Yellow Newtown, last of April; Rome (Rome Beauty), Northern Spy and Missouri, middle of April; Delicious, last of March; York Imperial, Ben Davis, Winter Banana and White Pearmain, first of March; Esopus (Spitzenburg), last of February; Gano and Black Ben, Stayman Winesap and Salome, middle of February; Ortle, February; King David, first of February; McIntosh, middle of January; Tompkins King and Wagener, January; Jonathan, first of January; Arkansas (Mammoth Black Twig), January; and Grimes, middle to last of December.

Southern Pacific Adopts "Hoover Corn Cake"

The Southern Pacific Railway sends a menu for corn-meal cakes, made according to this recipe: 4 cups of corn-meal, 3 cups of boiling water, 1 cup of cream, 3 eggs, 1 tablespoon of sugar, 2 teaspoons of baking powder; salt to taste. Mix well meal and water (do not let it lump), add the cup of cream, into which the three eggs have been beaten; then add sugar, and last, the baking powder. Bake on hot griddle.

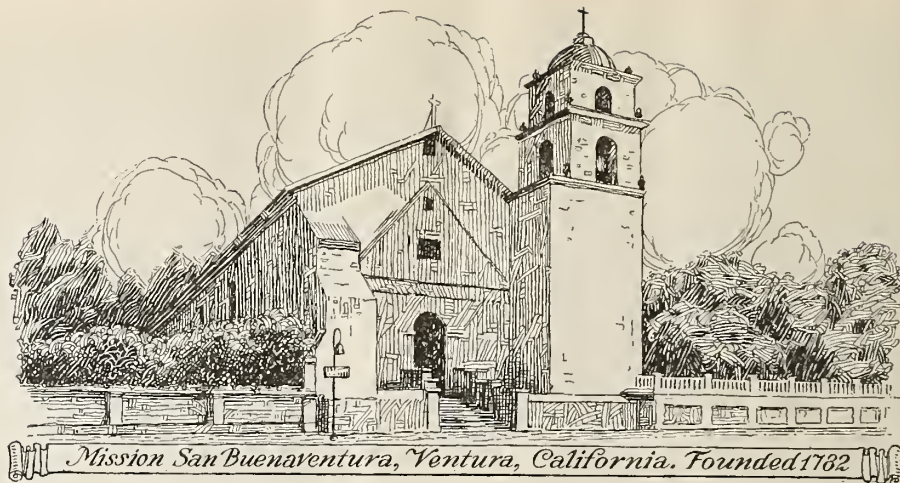
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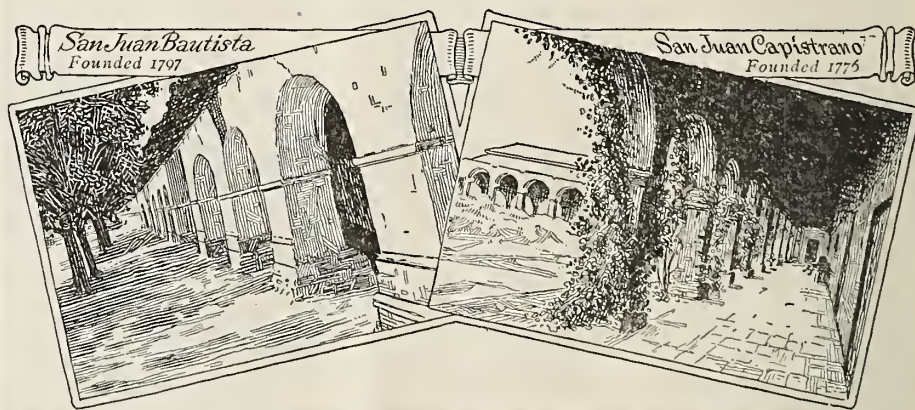
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Apple Scald a Preventable Disease

Department of Agriculture Discovers that Occasional Renewal of Air in Storage Houses Is An Effective Remedy

APPLÉ scald of green and ripe fruit in storage can be entirely and easily prevented by an occasional renewal of the air of the storage room, according to a discovery of the United States Department of Agriculture, just reported by Charles Brooks and J. S. Cooley in the Department's Journal of Agricultural Research. The basis of the discovery is the fact the apples are living organisms which breathe and, like other living things, have ventilation requirements which if not met lead to other smothering.

The report states that accumulations of carbon dioxide (carbonic acid gas) produced by the apples in storage, the lack of air movement in the storage rooms, and the depositing of moisture on the fruit, are all factors that may play a part in the production of scald. The relative importance of these factors is a matter for further investigations. The experiments indicate that high humidities may be maintained in storage without the development of scald, and prove conclusively that an occasional remedy of the air of the



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Protect your Fruit! This Super-fine Spray adds thousands of dollars to fruit crops!

If you want a big yield, drive out all the vicious pests and diseases that invade your orchard! Ordinary spraying, which merely controls the *outside* pests is *not enough* to insure a maximum yield. Millions of eggs and germs infest the microscopical niches and crevices in your trees, *where no ordinary, coarse spray can reach them.*

These are the pests that destroy millions of dollars worth of fine fruit each year! These are the vicious hidden pests which Fruit-Fog, the scientifically atomized Super-spray, seeks out and kills.

Thousands of growers now credit their clean orchards and bountiful yields to the thoroughness of this remarkable fog-like spray which controls *all* diseases and pests.

Read below why Fruit-Fog will help *you* harvest a wonderful crop of clean high-priced fruit.

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We manufacture over 50 styles of Hand and Power Sprayers and a complete line of fittings. Hayes spraying equipment is the accepted standard of thoroughness, speed in application and low solution cost, on thousands of orchards and farms. There is a Hayes outfit especially designed for any of the following uses:

Orchards	Potatoes
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Field Crops	Flowers
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Fruit-Fog Sprayers are tested to 500 lbs. They are positively guaranteed to maintain 300-lb. working pressure at full rated capacity. Every part of the equipment is built to give enduring service under high pressure. This requires not only the finest of mechanical construction, but the highest grade of hose, fittings, etc.

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Whether you own a few trees or a large commercial orchard there is a Hayes outfit for you. Find out about Fruit-Fog Sprayers at once.

FRUIT-FOG is produced from any solution by the 300-lb. pressure of Hayes Fruit-Fog Sprayers and the Hayes Nozzle. Its thoroughness is due to vapory fineness and adhering power—not to force. Fruit-Fog seeps into the most minute niches and crevices—most dense foliage; reaches under sides of leaves; works under bud scales and beneath fleshy stamens of apple blossoms. Positively will not knock off buds of leaves like coarse, heavy sprays.

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FRUIT-FOG no solution is wasted. It is so fine of texture that no drops form. Thus the usual heavy loss of solution is saved.

Naturally, Fruit-Fog uses much less solution than coarse, heavy sprays. It reduces spraying cost by a big percentage. Growers everywhere testify to the quickness with which Fruit-Fog can be applied. This is very important when you have only a few days for spraying.

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We maintain a department for the dispensing of professional knowledge, of scientific information. It is in charge of Mr. S. W. Foster, an entomologist of eleven years' practical experience, six of them in the United States Bureau of Entomology, stationed on the Pacific Coast.

We know of no man better equipped by thorough college training, and wide experience, to counsel the fruit grower. He is at your service. He travels extensively in orchard sections to keep informed, and to ascertain the best methods of insect and fungus control.

Definite and reliable directions for treatment of your trees no doubt will be of great value to you. The results obtained by the use of different spray materials, and under varying conditions, are yours for the asking. The time and method of applying spray materials are all-important. If you are uncertain what to do, or when to do it, write to us and Mr. Foster will reply.

We publish from time to time bulletins giving the best available information concerning insects and diseases. Write for the one in which you are interested.

(1) How to control the principal insect enemies and fungus troubles on deciduous fruit trees during the growing period;

(2) The dormant spraying of deciduous fruit trees west of the Rocky Mountains;

(3) Orchard Brand spraying materials.

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storage room will completely prevent the disease. This had been demonstrated in repeated experiments with several varieties of apples. Well aerated apples remained free from scald, while in all cases poorly aerated ones handled in the same way from the time they left the tree, throughout storage, became badly scalded.

Scalded fruit was found to be more mealy and poorer in flavor than unscalded. Scald, in addition to rendering the fruit unsightly and reducing its market value, rendered the apples extremely susceptible to storage rots.

Apples were apparently little harmed by several weeks' storage under poorly ventilated conditions if better aeration was provided before the fruit reached a certain critical period in its storage ripening. The maximum length of time that the fruit can remain in poorly ventilated storage without incipient injury, however, has not been determined for many varieties. Final recommendation in regard to the frequency of ventilation, therefore, cannot be given as yet, but the investigators state that the fundamental fact that ventilation will prevent disease has been established, and advise storage men to avoid taking chances of smothering the fruit.

Scald, it was found, increased with an increase in temperature from 41 degrees F. to 68 degrees F. Higher temperatures were unfavorable to the development of the disease, and with certain varieties such as Grimes Golden 32 degrees F. was more favorable to the development of the disease than 41 degrees F.

Investigations of this disease by the department specialists are still going on, but the facts already obtained indicate the necessity of important changes in storage methods.

Savory Potatoes for Home Supplies

When all the family gathers around the comfortable supper table every housekeeper takes pride in the substantial hot dishes she places before them. Nowadays an all-meat dish is out of the question, but a combination with potatoes will stretch the meat flavor and make an equally satisfactory offering. Here are some potato combinations that will please a hungry supper crowd:

Potato Pie—To one quare of hot boiled potatoes add enough hot milk to moisten. Season with butter and salt. Mash in kettle in which they were boiled and beat with a fork until light. Stir in half cup of minced ham. Have ready four hard-boiled eggs and half cup of stock or gravy. Arrange potatoes and sliced eggs in dish in alternate layers with potatoes forming top and bottom layers. Moisten with the gravy. Brush over the top with milk or egg and brown in hot oven. This dish can be arranged in three layers with the middle layer some kind of meat hash bound together with egg or thickened gravy.

Potato Turnovers—Boil and put through the ricer enough potatoes to measure a pint. Add one well-beaten

SPRAYING RESULTS

MYERS

COG GEAR SPRAY PUMPS ARE AT THE BOTTOM

Higher and higher go fruit prices. Greater and greater becomes the demand for it. More and more the importance of spraying is brought home to everyone, for marketable fruit must be perfect fruit and perfect fruit must be sprayed fruit.

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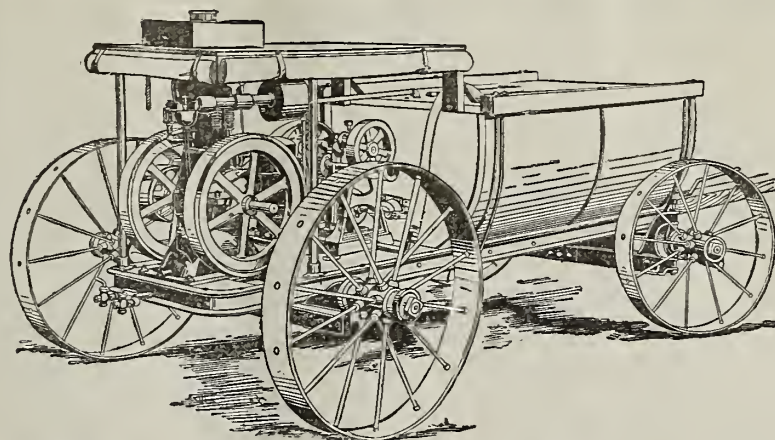
at the
Panama-Pacific International Exposition

egg, one tablespoon of flour and season with salt. Turn on floured board, roll out and out in circles size of saucer. Place on each a large spoonful of dry hash seasoned with onions and parsley chopped fine. This hash should be dry or bound together with thickening. Double over and pinch together like a turnover. Place on greased baking sheet and brown in hot oven. Serve with a thickened sauce made from the gravy in which the meat was cooked or with a tomato sauce.

Family Potatoes—Use six cold or freshly-boiled potatoes. Cut into quarters and put in saucepan with a pint of gravy or soup stock. Add one chopped onion, salt and a little red pepper. Simmer on back of stove half an hour before serving.

Red pepper, or paprika, is preferable to black pepper in these potato dishes.

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Portland, Oregon

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HOOD RIVER, OREGON

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A Monthly Illustrated Magazine Published in the
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All Communications Should Be Addressed and Remittances
Made Payable to

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Entered as second-class matter December 27, 1906, at the
Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

Fruit Products.—BETTER FRUIT has been advocating for years past, editorially and otherwise, the value of canneries, evaporators and by-product factories. "Fruit products" is a name that has recently been coined, which should always be used instead of by-products. By-products has a suggestion of something made from waste material, whereas fruit products indicates something more wholesome and far more attractive. The Northwest in 1917 for the first time made wonderful advances in the by-product business. All of the old canneries and evaporators have been busy—many new ones have been built and are running to the full limit of capacity, most of them working overtime. A new field is being developed for the fruit grower. Apples below grade, which have only realized \$4, \$5 or \$6 per ton for the fruit grower in the past, this year have been selling pretty generally at the following prices: Culls for vinegar, \$8 per ton; all apples below C grade, \$10 to \$13.50 per ton; apples below C grade, not too small in size, in good condition, suitable for canning or evaporating, have sold for \$12.50 to \$15. We are advised that Idaho growers were offered \$9 per ton f.o.b., with freight rate to factory of \$9 per ton, making the price equivalent in districts where any factories are located of \$18 per ton. In Watsonville, California, a few years past, evaporators have paid for good stock frequently as high as \$18 to \$20 per ton. It looks as if the fruit growers of the Northwest had developed a new business in one year that will take care of all apples below grade at a price that will pay the grower some profit. And equally, if not more important, is the fact that canneries and evaporators will this year establish a business that will enable them to take care of all the surplus of perishable fruits. In California fruit growers have been growing

peaches, apricots and pears and making big money at prices paid by the canneries, frequently selling all their crop in this way without shipping any fresh.

Pruning for Size.—The Northwest fully realizes that in competing with other apple sections, particularly in the East, it is necessary to produce a high-class product in every respect. That the Northwest can do this is beyond question or argument. They grow a great many varieties to perfection, which are not equalled in other sections of the United States, for which there is always a good demand for a reasonable quantity. It is generally admitted there is no question about the fact that consumption can be largely increased on Northwestern apples by proper diversity, salesmanship and publicity. But the very small apple can never be expected to pay a profit worth while on top of the freight charges that all apple produced in the West have to bear that are shipped to Eastern markets, consequently it is up to the grower to do away with the excess in small sizes. It is found upon a very thorough investigation that pruning is one of the most important factors in connection with the small apple. Professor V. R. Gardner of the Experiment Station, Corvallis, has given the matter of pruning for size special attention, and for the benefit of the fruit growers delivered and address on this subject at the Tenth National Apple Show in Spokane, which is produced in this edition. The article is so valuable and instructive that every fruit grower should read it carefully and learn how to decrease the amount of small apples produced in his orchard.

Size and Yield.—The apple crop of 1917 ran more largely to small sizes than usual, probably due to a number of causes. The season was not a rapid-growing season—the weather unusually dry. A great many fruit growers have allowed their trees to become too thick with limbs, consequently the tree sets too many fruits—too much of a top for the root system, which has a tendency to make small apples. The proper supply of plant food is also a large factor to be taken into consideration. Growers of strawberries and vegetables and all kinds of products that root very shallow find the yield continually decreasing. They are able to maintain a fair yield usually by two methods—fertilizing and subsoiling. Cover crops are also helpful inasmuch as they root deeply, bringing up the soil fertility from below, which can be cultivated into the top soil by plowing under. Cover cropping has been found very helpful to orchardists in increasing production by size. In addition the cover crop has an additional advantage of putting additional humus in the soil, which is quite a necessity. Roots from apple trees will go down several feet. It is a well-known fact there is a sufficient supply of plant food in the lower depth to supply an apple orchard for a great many years if made available. Blasting is reported very helpful by

many growers. It loosens up the soil down to a depth of several feet, permitting the roots of the apple trees to go down. In loosening the soil it also makes better drainage. Some orchardists who have been troubled with winter kill seriously in past years, by blasting under the roots of the trees in connection with the use of tile draining and cover cropping have eliminated practically all winter kill. A little common sense on the part of the fruit growers—a little more careful attention in regard to pruning and the condition of the soil will result in a splendid improvement in increasing size, increasing productivity. Fair-sized apples is a mighty important factor in returns on the apple crop—the larger the apples the less the cost of harvesting, sorting and packing, and the larger the apples the better prices obtained.

The Liberty Loan.—The complete success of the Second Liberty Loan, although expected, is an indication of the wealth of the United States and the patriotism of its citizens. The excellency of the selling organization is beyond praise, but more important than this is the cheerful and ready manner in which the bonds were bought. Capital and large business concerns subscribed liberally, but the most important factor in connection with the sale of Liberty bonds is the fact they were bought by millions of people in moderate circumstances. Many people have become bond owners who were probably never investors before the war. Great good will come out of all this in the future in making the working people more saving and creating in them a desire for investment. The Third Liberty Loan will probably be offered early in 1918, and we must all make ready to assist the government and the administration in every way possible to the fullest extent.

Increasing Farm Products.—The United States, during the war and for several years afterward, will have to supply the world with an increased percentage of food. The reasons for this are generally well understood. There are two ways—to increase our output, by intensive cultivation and by increased acreage. Every fruit grower and farmer who has uncleared land should clear all the additional land possible this winter to help feed those whom we will have to take care of in the future. In doing this you will be doing a humane act, and will also contribute to the prosperity of the country, and at the same time will improve your own financial condition and bank account.

Small Apples.—Small-sized apples this year may prove a blessing to many consumers, for the reason that the purchasers of a box of small sizes can supply all of his family, give each of the children an apple for their lunch basket, at a very small cost, which is quite important in these days of advanced prices on nearly all food commodities.

California Fruit Growers' Exchange.—Elsewhere in this edition is published an article which relates briefly to the achievement of this fruit growers' organization. It is very convincing and proves the value of fruit growers' associations, where properly organized and ably managed. It is pretty generally known that the orange growers of California were in despair about the future when the California Fruit Growers' Exchange was organized. The first mission of the Exchange was not so much to obtain increased prices for the fruit as to find the necessary markets to consume the quantity produced, which was necessary to save the industry. As everyone knows, the Exchange has been successful. While the condition of the fruit growers of the Northwest has shown much improvement in the last few years, there is still room for more improvement. The article referred to shows pretty conclusively the value of organization, also what organization can do. In "Union there is strength,"—organization can accomplish wonders, individuals can do but little.

Purchasing Equipment.—The war has caused unexpected and unusual conditions, for the reason that exports have increased, and for the further reason that many factories now are making munitions and war material and army supplies, consequently many manufacturers are unable to take care of their regular business. Many are unable to secure sufficient raw material. The condition has every indication of becoming even more stringent, consequently it seems wise to suggest to every fruit grower the advisability of purchasing and securing what additional equipment he will need for the coming year at as early a date as possible. There is not very much prospect of prices going down, with every reason to expect that prices will increase; and there is every reason to expect some articles may be very difficult to obtain if purchasing is deferred too long.

Y. M. C. A.—The subscription to the Y. M. C. A. fund for war purposes is exceeding the quota—surpassing expectations, which shows the splendid appreciation on the part of the people of the good work that is being done for the benefit of our soldiers at the front, in providing comforts for them, an appreciation of the splendid service they are rendering their country.

Strikes.—The November 10th edition of the American Industry in War Time has some interesting articles on strikes in connection with business prosperity and war conditions. The leading article is headed "Stop the Strikes or Lose the War." A map is published showing that important strikes have occurred in thirty-four states since the outbreak of the war. The United States has gone into the war, which everyone must concede, for the purpose of winning for reasons too well known to be necessary to explain in a brief editorial, and in order to win the war there must be

the fullest co-operation in every respect. The armies of the United States and of the Allies cannot win unless properly supplied with food, ammunition and equipment. In order that these supplies may be available to the fullest extent it is necessary to have the fullest co-operation of the entire population of capital and labor must co-operate and the United States. All lines of business, make many sacrifices. No differences should be permitted to arise if possible to avoid that will interfere with the success or postpone success.

Canadian War-Cake

No recipe has been more popular than the one for Canadian war-cake. Many people like this plain cake better than the cakes that call for butter, eggs and milk: 2 cups of brown sugar, 2 cups of hot water, 4 tablespoons of lard, 1 teaspoon of salt, 1 teaspoon of ground cinnamon, 1 teaspoon of ground cloves, 1 cup of raisins. Boil all these ingredients for five minutes after they begin bubbling. When cold add three cups of flour and two teaspoons of soda, dissolved in one teaspoon of hot water. Bake in two loaves in slow oven an hour and a quarter.

25c A MONTH RUNNING WATER IN THE COUNTRY HOME For Less Than City Rates

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Tasmanian Apple Crop

By S. O. Krantz, Manager School of Commerce, U. of O.

WE are informed that the apple crop in Tasmania for the present season was the smallest in recent years. It is reported that this year's exports will not exceed one million cases, while exports for last year aggregated two million cases. The cases contain about a bushel of fruit. England will take about 150,000 cases this year, and on account of the shortage in the crop the prices have advanced to \$2.25 per case at the home markets.

As you know, the producing season in Tasmania comes at a time of the year when it is spring here, so this shortage it seems has left that country without sufficient apples for its own use, and reports from there indicate that there will be a demand now for American apples.

The growers, however, are expecting a big increase in the crop next year and already are trying to arrange with the government to finance schemes for drying and preserving the surplus.

The University School of Commerce is in touch with the markets in all parts of the world and will be pleased at all times to furnish information on this subject.

ALPHA POWER SPRAYERS

For Quick, Effective Spraying



THE experienced orchardist, the man who understands the difficulties ordinarily encountered in efficient spraying work will appreciate the practical, sturdy construction of the Alpha Power Sprayer. Your careful analysis of the operation of each feature will show why the Alpha is a dependable HIGH PRESSURE spraying machine and a safe, permanent investment.

BUILT IN FIVE SIZES

THE PUMP

Equipped with the Alpha Automatic Pressure Regulator, which holds the pressure steadily at the desired point and relieves the engine and pump of unnecessary strain when nozzles are closed. All parts of pump are readily accessible and interchangeable.

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DE LAVAL DAIRY SUPPLY CO.

61 Beale Street, San Francisco, Cal.

much importance as a fertilizing element after all. Observed with more care, new phases of the matter present themselves.

In many places crops apparently continue to grow well without getting much new potash, which goes to prove only that they are securing a liberal amount from the native and usually insoluble supply in nearly every soil. Elsewhere, or on other farms not so well taken care of, the crops seem to start well, but to pause in their growth when nearly matured, and from then onward to become stunted. Rust of wheat and grasses, and many other troubles, have been noted with increasing frequency. The various fungus diseases of fruits certainly have shown an increase in those orchards which formerly had applications of potash along with other plant foods. The connection between potash and the resistance of plants and trees to disease is easily seen, as also is the fact that an excess of nitrogen at the same time tends to decrease resistance to the troubles and to make the plants and trees more liable to them.

The fertilizer situation still is as badly out of balance as ever, for there seems to be no immediate relief in sight respecting a potash supply. The only thing that can be done is to give thorough, deep cultivation, and to provide plentiful supplies of organic matter in the lower soil. If this is done moisture and heat conditions will be good, and bacterial activity will liberate much insoluble potash.

Those fruit growers who recently blasted their orchard ground are fortunate, as they probably are experiencing less trouble than others. Good orchards that have not been subsoiled should be treated to that kind of intensive tillage just as soon as the ground is dry enough, and in preparation for it heavy-rooted cover crops might be sown at once. The later blasting will not hurt the plants, while the roots will be ready to penetrate the loosened and crumbled lower soil at once.

A quantitative analysis of almost any ordinary soil in a recognized orchard section will show many thousand pounds of actual potash in each acre to a depth of four feet. Most of it is of the native supply, dissolved out of minerals present in the original rock from which the soil is derived. Some of it, however, is simply potash that was applied in commercial fertilizers, and which reverted to insoluble forms owing to improper or unfavorable soil conditions prevailing at the time.

There is enough in the top foot of ground to last many years—if it would by any means be released fast enough to supply trees properly. As it cannot be, a second and third and fourth foot of soil must be put to work and subjected to the action of the right amount of moisture, to heat, to the effect of organic matter decaying, and to bacterial activity. Enough potash then

Your horses are glad when you use Mica Axle Grease. The powdered mica makes a smoother spindle. The wagon pulls twice as easy, and the grease lasts twice as long.

STANDARD OIL COMPANY
(California)

MICA AXLE GREASE

Potash and Plant Diseases

IT is a well known fact that all plants, including apple and other trees, are more subject to the attacks of fungus diseases and even of insects when not plentifully supplied with potash. This is particularly true when the nitrogen supply is kept up while the potash supply becomes exhausted. The present situation, therefore, may be studied from this angle with a good deal of interest.

For several seasons now potash has been almost impossible to obtain on an economical basis for fertilizing purposes. Little advance has taken place in the price of phosphorus-bearing fertilizers. Nitrogen, though high in price, has been continued in fertilizers to as large an extent as ever. Viewed hastily, the results over the country in crops grown have called out remarks to the effect that potash may not be of so

may be derived from the soil to keep the trees going.

There is no practicable way of getting organic matter deeply into the soil of an orchard except through roots that grow down. Annuals—plants which live one year and then die—have masses of roots, some of which penetrate several feet. The breaking up of the soil is only the beginning of the process of liberating unavailable food elements. It must be followed by the penetration of these roots, so that each succeeding season, as a crop dies and another comes, there will be more and more vegetable matter accumulating and decaying.

Even the best informed agriculturists as yet understand too little about the feeding of plants. It seems to be well established, however, that the lack of any one of the three important foods will cause troubles, and that these troubles may not take the form of simple starvation or refusal of plants to grow. Perhaps some day we may be applying fertilizer and giving intensive tillage as a partial substitute for spraying, just as fresh air and exercise sometimes may be substituted for medicine in the treatment of a sick man.—Contributed.

Breakfast Fillers—The Potato Leads

Count over your breakfast fillers—hominy, potatoes, apples. Cross off hominy for the present. The new crop of corn is not yet hominy, and when it is, it will keep for winter and spring. That leaves you apples or potatoes or both. The big crop of potatoes calls for the service of all housekeepers. The growers stood by the flag, and now—the housekeepers must stand by the growers. That is their service. Fried potatoes, hashed brown, creamed? Cross off fried potatoes. Try some new ways. Frying means fat, trouble, and often a poor food product. And fats must be conserved carefully. Hashed-brown potatoes please everyone, and, though they are usually regarded as a hotel luxury, you can turn out a better dish at home.

Hashed-Brown Potatoes—Chop six boiled potatoes and season with butter, salt, and onion and parsley chopped fine. Moisten with milk and mash lightly. Place in a hot greased pan, preferably an iron skillet. Spread potatoes evenly over the pan. Cook until golden brown. Fold over like an omelet and serve.

Savory Potato Loaf—Three cups hot riced potatoes, half cup of sausage meat, two tablespoons of milk, one teaspoon chopped parsley, half teaspoon salt, half teaspoon grated onion. Mix together all ingredients. Place in a baking dish, and bake half an hour. Serve from dish.

Red Cross.—The very generous subscription to the Red Cross fund is splendid evidence that our people are eager in their desire to give our boys who happen to be wounded or sick at the front the very best care possible.

When made into apple butter, even the ugly windfall has a glory of its own.



Be "U. S. Protected" For Winter Barnyard Tasks

When the ground is shrouded in deep snow and the thaws bring ankle-deep, oozy mixtures of mud and slush, keep your feet warm, dry and comfortable in

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Built for heavy service, double duty, this rubber footwear is impregnable to assaults of wet and cold—made to defy storm, sloughs and snags. Not only does greater comfort make this footwear most desirable, but sturdiness and long wear mean money saved.

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United States Rubber Company
New York

U. S. Rubber Footwear



\$1285 f.o.b. Portland, Oregon

Here is a tractor that is small enough to go under your orchard trees, yet so powerful that it does the work of 10 horses in any weather, on any soil—the **Cleveland 12-20**. It goes anywhere in all soils, because it **crawls on its own tracks**.

Cultivate more of your land—do it all quicker and cheaper with a **Cleveland**. This wonderful little tractor plows 8 to 10 acres a day—the work of two to three 3-horse teams and three men.

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Cleveland Tractor **McNeff Tractor Company**
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Unloading one of the four carloads of **CLEVELAND TRACTORS** at Portland, Oregon. (They are all sold). We recently shipped a carload into Hood River. Order yours now—we have some on hand.



Markets Opened by Advertising

In a circular sent out last year the Northwestern Fruit Exchange called attention to the fact that new apple markets were being opened in the United States and Canada, Northwest apples being taken hold of by jobbers and retailers in communities which had in a sense never before heard of the wonderful fruit of this section. It appears that this season this process has further developed in a remarkable degree. In a word, scores of new markets, many of course of limited capacity, have this season placed their orders for Northwest apples for the first time. In examining this situation the Northwestern Fruit Exchange calls attention to an effect of it that might ordinarily be overlooked, namely, that the wider distribution of Northwest apples in smaller markets takes off the pressure of oversupply from the larger markets.

Thus not only is there a larger demand, an outlet for a larger output, but the result is also steadying as to prices, and withal an important factor in obtaining full or higher prices.

"This is undoubtedly a very salient feature of the Northwest apple deal this season, and it is a very important one," states W. F. Gwin, manager of the Exchange. "It is primarily due to advertising. The 'Skookum' national campaign last year is having further effect this year; our this year's campaign, just now getting under way, will be heard of as much next year as this, and in coming years. We anticipate that when other Northwest apple growing and shipping interests get together and advertise, as undoubtedly they will, the effect will be of almost incalculable economic benefit. Northwest apples were at one time known only in the big markets, New York, Chicago, Boston, and so forth. If some means had

not been taken to remove this or improve this condition, there would have been congestion. Advertising tied to necessary proper selling and transportation effort has made innumerable rivers of apples flowing from this great Northwest to innumerable markets, when before we had a few large rivers flowing only to a few large centers and threatening to flood them."

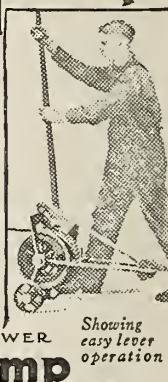
Use the soft-shelled eggs at home. They ship poorly and may lower the grade of the others.

Tractors are the busy Berthas of agriculture.

Pull Big Stumps by hand

Clear your stump land cheaply—no digging, no expense for teams and powder. One man with a **K** can rip out any stump that can be pulled with the best inch steel cable.

Works by leverage—same principle as a jack, 100 pound pull on the lever gives a 48-ton pull on the stump. Made of the finest steel—guaranteed against breakage. Endorsed by U. S. Government experts.

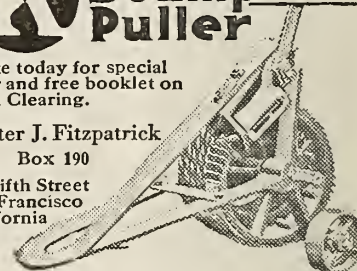


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Winesaps, Jonathans, Y. N. Pippins and Rome Beauties, with Elberta and Salway Peach fillers.

One and a half miles average distance from depot, packing house, school, church and stores. The land is platted park style and can be sold in tracts of one acre and upward.

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Nice Bright Western Pine FRUIT BOXES AND CRATES

Good standard grades. Well made. Quick shipments. Carloads or less. Get our prices.

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rifle, skates, sweater, tool kit, etc., taking subscriptions for America's greatest fruit paper. Every fruit man should read it. Your neighbors will want it. Write today for sample copy and illustrated list of Rewards full of Christmas suggestions. Address: **Green's American Fruit Grower** 312 Plymouth Court Chicago, Ill.

The Farmer's Responsibility of the Great War

By Clarence Dubose, Department of Agriculture

THE war has given to the American farmer the greatest responsibility, the greatest privilege and the greatest task any man or any class of men have ever known. The American farmer in large degree will determine the trend of human history for all time to come, because the enormous ultimate consequences of this conflict rest primarily upon the farmers' production of food and feed to sustain the fighting forces. They might fail even with an adequate food supply; without it they are certain to fail. But in his field, far from the fury of battle, far from either the adventures or the horrors of the firing line, the American farmer will say whether autocracy or democracy shall rule the world during the seasons that are to come.

In a sense the war will be won or lost in the fields, gardens, orchards, pastures and hog lots of the American farmer. The hope of the American citizen, not a farmer, also hinges upon adequate agricultural production. Our aeroplanes are useless, our guns are spiked and our rifles jammed, our shells are but as harmless baubles, if the farmer fails. This must be understood in all its grim force by every man, woman and child in America; by farmers and by those who are not farmers.

With food we can win the war.

Lack of food will lose the war.

Whether or not we produce the food depends upon whether or not each and every individual farmer does his level best on his farm—produces its maximum.

But the "agricultural problem" means not merely the production of food-stuffs and feedstuffs and live stock. It means the conservation of the food after it is produced. That puts the "agricultural problem" squarely up to everyone from the man on a forty-acre field to the man whose fertile lands run farther than he can see; from the tenebrous cave-dweller to the occupant of the costliest mansion.

The agricultural problem today means to every American, and indeed to every civilized person on earth, simply whether he shall, when this strife ends, be a free person in a free land or whether he shall be bossed from Berlin. That is the precise interest that you, now reading these lines, have in the agricultural problem in America today. You may have been a farmer all your life or you may not know the difference between a straight furrow and a threshing machine—no matter what your condition may be, one of the two divisions of the agricultural problem is yours: to produce food or to conserve food.

Many people have thought of the war as "far away," as a remote, impersonal thing, a sort of dreadful nightmare—but not as a spectre menacing our immediate persons and property. Our appreciation of the actuality is more poignant now, with our own flesh and blood upon the firing line. That firing line is in France today. It will come to America if the farmer fails. No mat-

ter what course military strategy may take, the final battlefield of the war is already fixed. The Waterloo of the Prussian autocrat and all he stands for, or the Waterloo of American liberty—the end of autocracy or the end of democracy—the end of Prussianism or the end of freedom—will be wrought on the battlefield of the American farm—every American farm.

But even victory there will not avail if we lose in another equally fateful battlefield—the American kitchen. If we produce to the limit of farm resources and energies and do not conserve what we produce we may lose

by waste. No conceivable responsibility could be more grave, no privilege more proud, no opportunity more rich for significant service than the American farmer has today. The war has sounded a call to duty to every individual throughout civilization. The course of the individual life is not now to be considered in terms of self. The question dominating every individual is for what service can he be used—what can he best do to help win the war. To some the call comes to march away with uniform and gun, to some it comes for the organization and administration of parts of the great war machine—to the American farmer comes the call to feed the forces fighting for liberty. To every other man, woman and child comes the call to save.

This 15-Feature Tractor Will Almost Run Your Place

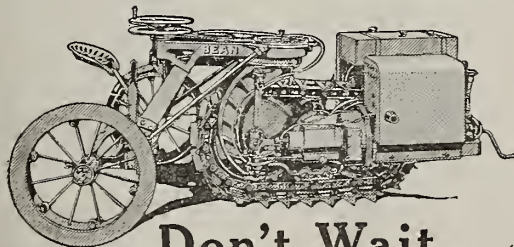
15 FEATURES—invaluable in orchards—make this the needed tractor.

No other tractor of the track-laying type sells at so low a price. And no other has such advantages as the *patented front drive*.

The Bean TrackPULL Tractor turns clear around inside a 10-foot circle (5-foot radius), and it has *full power* even on so *short* a turn. It plows and harrows close up in the corners, and right up to the tree trunks. It goes under branches only four feet off the ground. The fuel is far less than other types doing the same amount of work.

When not in the field this

BEAN TrackPULL Tractor 6 H. P. at Drawbar



Don't Wait

Material costs are rising every day because of the great demand for metals. Our low price of \$1215 may have to be again increased. So don't wait; send in the coupon now. Sending it doesn't obligate you. It simply brings full information.



tractor's 10 h. p. pulley runs your stationary machines.

Sooner or later you'll decide, without doubt, that you want a tractor to do these things.

So don't buy a tractor until you know all the facts about this remarkable agricultural aid.

Before you turn this page send for full information about the Bean TrackPULL Tractor.

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Without any obligation
on my part, send me Bean
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APPLES**PEARS****ORANGES**

**For European Distribution.
Boxed Apples and Pears a Specialty.**

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Cables: "Geracost, London."

Codes: A. B. C. 5th Edition and Private.

Shipping Agents: LUNHAM & MOORE, Produce Exchange, New York.



Plant Fruit Trees

Increase the value of your land.

Every horticulturist on the Pacific Coast should have a copy of our new catalogue.

WRITE FOR OUR CATALOGUE

It contains information about all varieties of fruit bearing trees.

SENT FREE ON REQUEST

FRESNO NURSERY COMPANY

Address Dept. H., Fresno, California

Apples for America and Europe

W. E. Aughinbaugh in Leslie's Weekly

[EDITOR'S NOTE—This article, which appeared in Leslie's Weekly October 6, 1917, was submitted to BETTER FRUIT by the Service Department of Leslie's Weekly with permission to publish it, which we are glad to do for the valuable information it contains for the benefit of the fruit growers.]

DURING the season of 1914-1915, American apples to the extent of 2,667,873 barrels and 1,423,132 boxes were exported to Europe, Asia, Africa, and Latin America. In addition it is conservatively estimated that more than 500,000 boxes and barrels of this fruit went to such countries as Porto Rico, Hayti, Santo Domingo, Hawaii, the Philippines, Mexico and parts of Canada, of which no record was made. Since this date it has not been possible, due to the demoralized condition of shipping facilities, to obtain accurate data regarding this industry. These figures take no account of shipments of dried and evaporated apples, a special field of this business which is yearly increasing, the product being in great demand in Europe and Latin America.

Apple growing and shipping is properly entitled to be designated as one of the major industries of this country, involving annually from 50,000,000 to 75,000,000 of barrels, an output valued at approximately \$100,000,000. These figures relate only to apples handled in a commercial manner and do not take into account those grown and consumed otherwise. Some idea of the importance of this business may be formed when I state that at the last meeting of the National Apple Growers' Association a resolution was adopted urging the Government to devise some appropriate method for obtaining statistical

information on this young and important industry.

Apples are destined to form an important item in the diet of this and other nations. The present economic condition of the world is bound to give a great stimulus to the use of this fruit and its future as an article of export is assured. Mr. Louis B. Magid, president of the Appalachian Corporation, which operates the largest apple orchards in the world, having more than 350,000 trees in bearing, and an authority on apple shipping, expects that the next few years will see this industry develop materially, and believes that the foreign trade in this fruit will far surpass that of any similar line.

The war in Europe will benefit the American apple grower materially, due to the fact that the three years of hostilities have resulted in the destruction and neglect of apple orchards throughout that continent, with the obvious result that buyers can look only to this country for their needs. Northern France, for example, before the war produced fine apples, most of which were exported. Today that territory is virtually destitute of apple as well as other orchards. Such trees as were not blasted by gunfire, or ruined by poisonous gases and conflagration, have been cut down by the retreating Germans. The hills and mountains of northern Italy were prior to the conflict in that country productive of a high grade variety of apples, which were eagerly purchased by dealers. These orchards have suffered as have those of France. Russia was a producing power in the apple trade of Europe and its climate and soil are especially adapted to raising this fruit. Industrial and political

demoralization, together with a heavy depletion of the man power of this wonderful land, have eliminated Russia from this line of endeavor. China does not grow apples, neither is the fruit raised for commercial purposes in any parts of Asia. In the Latin-American nations Chile alone raises apples, but enough only for home consumption. Incidentally I may state that the Chilean apple is without a peer anywhere, and, being ripe at a time when our apples are out of season, the possibilities in this line alone are really wonderful, but up to the present no one has taken advantage of the situation.

As competitors in the apple industry the United States had only Canada and New Zealand to consider. The production of the former is small and railway freights from interior points are liable to prohibit the exportation of apples to a great extent, while the long distance that New Zealand has to bring her fruit to market militates against her ever being a serious factor in the trade. As a consequence our position today is ideal and if we take advantage of conditions there is no reason why this country cannot dominate this trade for years to come.

Through proper advertising and marketing campaigns, which should be started immediately, the entire world can be made to eat American apples. The nature of the fruit makes it an admirable article for exporting to any part of the globe, and American apples

Attention, Fruit and Vegetable Growers

CAN your Fruits, Vegetables, Meats and Fish in Sanitary Cans, with the H. & A. Steam Pressure Canning Outfits, built in Family, Orchard and Commercial size; seal the cans with the H. & A. Hand or Belt Power Double Seamer; they will save your perishable fruits and vegetables at ripening time when nothing else will. Write for descriptive matter.

Henninger & Ayes Mfg. Co.
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Cherry Trees

Fruit and Ornamental Trees, Shrubs, Vines, etc. *Free Catalog. Agents Wanted. Special Terms.*

MILTON NURSERY COMPANY
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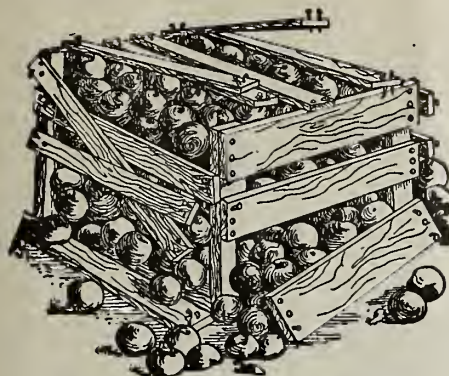
WALNUTS

Can be grown on a great many farms in the Northwest. If you had planted grafted walnut trees a few years ago you could be selling the world's finest nuts today for from 25c to 30c per pound. Will you have any to sell a few years from now? Our grafted Franquettes are the best on the market and are sold as low as many seedlings.

6 to 10 ft. trees	\$1.25 each
Dozen lots	1.15 "
Hundred lots	1.00 "
Thousand lots90 "

Special prices to the trade.

GRONER & McCLURE
Hillsboro, Oregon



BEFORE using Cement Coated Nails

Western Cement Coated Nails for Western Growers

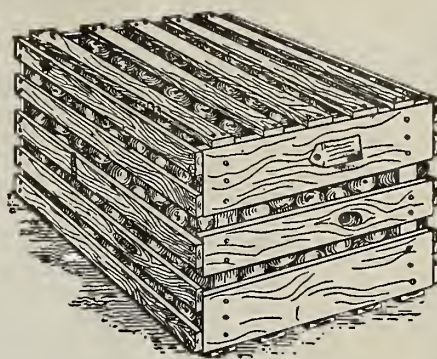
Our Cement Coated Nails are always of uniform length, gauge, head and count. Especially adapted to the manufacture of fruit boxes and crates. In brief, they are the Best on the Market.

Write for Growers' testimonials.

Colorado Fuel & Iron Co.

DENVER, COLORADO

Pacific Coast Sales Offices
Portland, Spokane, San Francisco
Los Angeles

AFTER use of C. F. & I. Co.'s
Cement Coated Nails

are accepted today as the standard for all purposes.

The possibilities for creating demands for dried fruits in overseas markets never were better, and excess crops could be conserved for future use, for the entire world is fruit hungry.

The great apple-producing states of the Pacific Coast and the Atlantic and middle sections of the country prior to the war developed a remarkable export trade for their choice fruit with the nations of Europe now engaged in the terrific conflict for supremacy. This trade has fallen off very materially because of the high freight rates, which have been almost prohibitory. But our apple growers, by turning their attention to the nearer markets on our own

continent, while the opportunity presents itself, can open a wider and perhaps a richer field for the enlargement of their trade. The one thing lacking, of course, is a mercantile marine, and most unfortunately this is lacking because of the anti-subsidy feeling on the part of some representatives in Congress from the Pacific Coast and the farming regions of the interior.

Ways to Reduce Car Shortage

Office of Information, U. S. Dept. Agriculture

While much has been done to relieve car shortage, the fall movement of crops puts a heavy strain upon transportation facilities. Each autumn witnesses a sharp increase in rail tonnage, and the conservation of the country's transportation facilities and the most efficient use of cars by shippers of perishable farm products is just as important at this time as during the spring and summer, according to the Bureau of Markets of the United States Department of Agriculture. Between May 1 and September 1 of the present year the Special Committee of the National Defense of the American Railway Association succeeded in reducing the number of unfilled-car requisitions by more than 78 per cent, but there is still no surplus of cars.

Cars, packages, commodities, time in transit, and seasons are variable, and the department has no accurate data from which rules can be laid down as to the exact quantity of a given commodity of a certain degree of maturity which can be loaded into a car for a definite haul to a particular market; but cooler weather makes refrigeration less necessary and makes it possible to run more commodities under ventilation and to load cars more heavily than during the summer.

The following thirteen commodities are now moving to market in carload lots: Apples, cabbage, cantaloupes, celery, grapes, lettuce, onions, peaches, pears, sweet potatoes, tomatoes, watermelons and white potatoes. The movement covers thirty-two states, with an average of more than three of the commodities from each of the thirty-two states.

The transportation situation is still serious, and shippers of these commodities are reminded that patriotism

demands of them the heaviest loading possible consistent with the safe carriage of the goods. The failure of one shipper to load cars to the maximum may prevent other shippers from getting any cars at all, with a consequent loss of those foodstuffs on which the winning of the war depends.

The present is a time for the closest co-operation of all interests for the most efficient utilization of cars. Shippers also should load and unload cars promptly and should place diversion orders at diversion points before the arrival of cars to be diverted.

LAND CLEARING

In an article on "Land Clearing," by Thos. Cunningham, farm manager for the Western Fuel Co., he says: "Taking up the question of stump-pullers. These are divided into several classes, gasoline, stumping outfits, steam donkey logging engines, horse-power stumping machines and hand-power stumping machines. Gasoline and steam donkey outfits have their use in sections where labor is not easily procurable, but I consider them to be costly. The cost of the outfit is heavy. Their bulk and weight makes their transportation from one point to another extremely costly. There are several hand-power stump pullers on the market that seem to answer every requirement and operate economically. I recently saw a demonstration of the "K" HAND-Power Stump Puller that was most interesting. It is manufactured by W. J. Fitzpatrick, of San Francisco, California, weighs 171 pounds and can be wheeled around like a barn truck. The agent attached it to a standing tree (fir) about 36 inches in diameter, placing the cable about 12 feet up the tree. I took hold of the lever and pulled the tree down myself in eight minutes. I bought the machine on the spot and have pulled the stumps from 30 acres of land with it since, the machine costing not one cent for repairs.—Adv.

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Wholesalers of Nursery Stock and Nursery Supplies

A very complete line of

Fruit and Ornamental Trees, Shrubs, Vines, Etc.

SPECIALTIES

Clean Coast Grown Seedlings

Oregon Champion Gooseberries and Perfection Currants

Write Now — Write Now

Wanted

Thoroughly competent working foreman, single man preferred, for large orchard and vineyard property. Must be able to run all branches of business with economy and snap. Address with full particulars as to age, training, experience, personal data and salary expected.

GROWER, care Better Fruit.

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Coyotes, Moles, Lynx, Cats, Muskrats and Martins bringing record prices.

Send for Price List and Tags.

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FARMING is PLEASANT

in the "Sunny South" for Nature has blessed this favored section with mild, healthful climate, productive soil and all that makes life worth living. You can buy good farm land in Virginia, West Virginia and North Carolina at \$16 per acre and up. Fruit, truck, poultry and general farming will prove successful here. Write for information, illustrated literature, etc., today.

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Growers and Shippers of

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SPECIALTIES:

Apples, Peaches, Pears and Cantaloupes

TOPPENISH, WASHINGTON

Which is Yours?

Two great tasks stand out today: The FEEDING OF THE PEOPLE and the FEEDING OF THE GUNS.

Maximum food production is obtained by the use of

Nitrate of Soda

which contains 15% of nitrogen immediately available. It is nature's indispensable plant food and energizer.

Information gladly furnished on request.

Nitrate Agencies Co.

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Leather is honeycombed with pores. That's why sweat, moisture and dust so easily weaken your harness. Eureka Harness Oil prevents this - protects the leather fibre - keeps straps and tugs soft, pliable and strong. Keeps harness jet black.

Eureka Harness Oil

Standard Oil Company
(California)

Making Old Trees Bear

A tree is simply a big plant. It is fed through its roots and leaves the same as the tiniest clover plant. The fact that it is large and sturdy looking leads many to believe a tree can be neglected; that it doesn't need the cultivation, fertilization and general care that must be bestowed on smaller species of plants to make it thrive.

However, this belief is fallacious. To be sure, many trees will do fairly well even if neglected. But the same is true

of more fragile forms of vegetation. Some will die, others will continue to live, but will not show healthy growth; nor will they bear well if they are fruit trees, unless they happen to be favored by especially favorable natural soil conditions.

Hard, impervious soil is the tree's greatest obstacle to maximum thriftiness.

Plowing the surface, between and around trees, helps some, but when a tree is eight or ten years of age or older its roots go down several feet.

The plow cannot break up the hard subsoil and thus little or no relief is afforded the feeding roots by plowing. In fact, surface plowing encourages shallow rooting, which every horticulturist knows is bad for a tree.

To date the only practical remedy that has been found for hard soil is blasting with dynamite. Its use enables the orchardist to deeply stir and break the subsoil.

The blasting is quickly and easily done. Usually an inch and a half soil auger is employed to put down holes to a depth of about three to four feet. One-quarter pound charge of a slow dynamite, five or six feet out from the trunk, is generally sufficient for a tree under five years old. For larger trees, from two to six charges, planted at different points around the trunk, will be required. The proper point to place the holes for the older trees is out at about the edge of the foliage line.

The effect of the blasting is to break up the hard soil, enabling the roots to advance easily into new feeding beds; also to increase the water-storage capacity of the subsoil so that the tree may not suffer from lack of moisture during periods of drought.

Apple Shipments.

Up to November 26, this year, 13,129 earloads of apples had been shipped from the Northwest. Up to the same date in 1916 11,552 cars had been shipped.

The licensing of fruit and produce dealers will increase the confidence of producers as well as consumers. It will be an incentive toward greater production.

Fresh air and sunlight combat disease in the stable. Dairy barns should be airy barns. Ventilation is conservation.

Fly a flag on the farm and teach the children what it stands for.

Throws a Cloud of Spray



The Hardie Orchard Gun saves your time and muscle—no long, heavy rods to hold.

Turns a big job into a little one. One man with a Hardie Gun will do more work and do it better than two men with the old-fashioned rods.

Hardie Orchard Gun \$12

Low price made possible by big production—send for the Hardie Catalog today. Hardie Sprayers and spraying devices standard for 18 years.

THE HARDIE MFG. CO.
Hudson, Mich.
Also Portland, Ore.

Northwest Fruit in Brazil

Horace A. Cardinell, Department of Agriculture,
Rio Janeiro, Brazil.

ON December 30, 1916, nine men, contracted by the Minister of Agriculture of Brazil, sailed from the port of New York, accompanied by Mr. A. V. d'Oliveira Castro, representing the Department of Agriculture of Brazil. Three of these men are under the Climatology Division, working mainly on deciduous fruits, which as yet are practically unknown to the fruit growers of this semi-tropical country. The Pomological Division is composed of O. T. Clawson, formerly inspector at large of the Wenatchee Valley; William Johnstone, of the University of Kentucky, and myself. As we stepped aboard the Lloyd Brazilian steamer "Minas Geraes" that cold December morning in New York we were greatly surprised to see several hundred boxes of Wenatchee Valley and Blue Diamond Brand Hood River apples being loaded into the hold.

Three days after leaving New York City we reached what would correspond to a typical middle of May day in the Northwest and two days more brought us to very warm weather at Porto Rico. I am trying to give comparative climatic conditions in order that Northwest growers may realize the extremes and sudden changes of temperature and humidity to which this fruit was subjected, for after accompanying this fruit to its destination we were all surprised at its condition, which I will describe later. Twelve days from New York we entered the Tocantins River, a branch of the Amazon, and after a half-day run up this jungle-banked river we came to the wonderful City of Belem, Para, the richest rubber center in the world.

That afternoon, ashore, we happened upon a prominent merchant of Para, and Mr. Castro learned for us, as none of the rest of us could speak Portuguese, that this merchant had purchased the larger part of this cargo of apples and pears. Learning our interest in this shipment of fruit, the owner volunteered to meet us the next afternoon in the customs house, where he would allow us to open several boxes. Also I might state that quite a friendly rivalry had occurred between Mr. Clawson and myself, for I had spent seven years in Hood River on my uncle's ranch, the late Mr. H. S. Butterfield. Hence Wenatchee and Hood River had it out twenty miles from the equator over the keeping quality of the fruit from the two districts. Much was the surprise of all concerned on opening many boxes of Spitzenbergs from Hood River and Rome Beauty from Wenatchee to find the Romes comparatively free from storage scald and only one specimen among the Spitzenbergs that showed any decay.

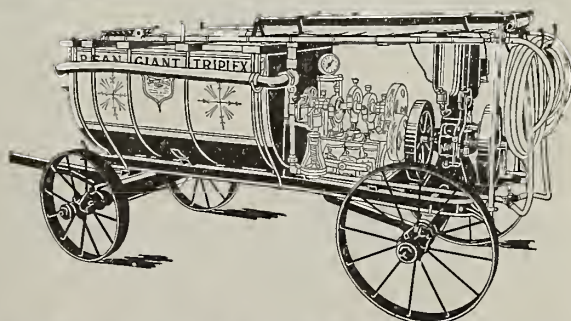
We reached Rio de Janeiro January 25, 1916, and on the 28th we were invited as a guest of Dr. Besara, Minister of Agriculture of Brazil, to attend the "Third Grand Horticultural Exposition," held in the capital. Here we saw displays of imported as well as native

J. C. Butcher Company

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**Lime and Sulphur
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**Bean POWER
SPRAYER**
The 10-point sprayer

You should know about Bean Porcelain Lined Cylinders, the Bean Pressure Regulator, the Pump without a stuffing box, Bean Underneath Suction, the Bean Refiller, Bean Eccentrics, the Bean Rocking Bolster, Bean interchangeable parts and Bean threadless ball valves.

You owe it to your orchard and to your pocket book to learn all about Bean Power Sprayers and the Bean complete line of hand and barrel pumps and accessories. You get Bean durability—reliability—efficiency—sturdiness in any Bean outfit you buy.

See your nearest Bean dealer at once or send coupon to us for the big Sprayer Catalog.

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Send me the Bean Sprayer Catalog.
I have acres of
I am interested in ☐ hand pumps, ☐ power
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ADHESIVENESS or holding power is the reason for PEARSON nails. For twenty years they have been making boxes strong. Now, more than ever.

RELIABILITY behind the goods is added value. You can rely on our record of fulfillment of every contract and fair adjustment of every claim.

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ORIGINALITY plus experience always excels imitation. Imitation's highest hope is, to sometime (not now) equal Pearson—meantime you play safe.

NAILS

fruits and I read many familiar names of Northwestern growers on the labeled boxes. From my inquiries I learned that the above mentioned Brazilian merchant, last fall, paid the New York fruit exporter \$2.65 per box for first-grade (Blue Diamond) apples and it cost him \$1.05 per box transportation, and after he paid import duty, etc., he had to sell at \$7 to \$7.50 per box. Thus it is plain to see that the apple, and to a similar extent the pear, is a decided luxury in Brazil as yet.

I left Rio de Janeiro May 15, 1917, for the United States, representing the Minister of Agriculture, and at that late date hundreds of fruit stands and fancy grocers were daily displaying dozens of boxes of Northwestern fruit which had been taken out of storage in New York, placed in the common hold of an unrefrigerated ship, spent 28 days through the tropics and again placed in cold storage and still being sold on the market in sound condition, and from the appearance of said fruit I feel sure it was still being displayed as late as July, 1917.

Some of the Pacific Coast growers whose fruit I saw in South America were: Newtowns from George Gallo-way, Hood River, and V. A. Crow, Davidson Fruit Company; Newtowns, extra fancy, from the Del Rio Orchard, Devel Welks, and orchards of Gold Hill, Oregon; K. P. Keeble (half box pears), San Jose, California, and G. H. Anderson, half box E. Buerre pears, San Jose, California.

The Real Test

Not gravity, but boiling points, is the real test for gasoline. Red Crown has the correct boiling points in a continuous chain.

Standard Oil Company (California)

The Gasoline of Quality

Homemade Fruit Butters

As a final drive on fruit preserving the United States Department of Agriculture urges the making of homemade fruit butters. This is recommended not only to those who grow the fruit, but to those in the city who may take advantage of large supplies and cheap prices. In a great many cases it will be possible for city people to get from outlying farms fruit which might otherwise be wasted.

Various fruit butters recommended are apple butter with cider, apple butter without cider, apple butter with grape juice, apple butter with lemons, pear butter, peach butter, plum butter, and Garfield butter made with plums and peaches. With the exception of a good preserving kettle very little equipment is needed for the preparation of such butters.

Apple Butter.

There is no better way to use good apples, says the department, than to make them into butter. The sound portions of windfalls, wormy, and bruised apples may also be used. The better the apple the better the butter will be. In apple butter with cider either fresh sweet cider, or commercial sterilized cider should be used, after being boiled down to about half its original quantity. The peeled and sliced apples may be cooked in the boiled cider or they may be first made into apple sauce which is then cooked

Pittsburgh Perfect Cement Coated Nails

are of the highest standard

The Heads don't come off. Given Preference by Largest Pacific Coast Packers

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PITTSBURGH STEEL COMPANY, Pittsburgh, Pa.

A. C. RULOFSON COMPANY, Pacific Coast Agents
359 Monadnock Building, San Francisco, California

in cider. It usually takes about equal quantities of sweet cider and sliced apples to make butter of the right consistency. In other words, two gallons of sweet cider should be boiled down to one gallon, and two gallons of the prepared apples should be added to it either uncooked or as apple sauce. The two essentials of good apple butter are long, slow cooking—from four to six hours—and frequent stirring. If sugar is used, it should be added after the cooking is about two-thirds done. About one pound of sugar is the usual proportion for each gallon of apple butter but more or less may be used to suit the taste. The butter may be spiced with cinnamon, cloves and allspice, or with any one of the three, the spices being stirred in when the cooking is finished. While still boiling hot the butter should be packed in sterilized glass receptacles, or in stone jars, with thorough precautions against spoiling as with any other preserves.

Apple Butter Without Cider.

Good apple butter may be made without cider. In this case enough water is added to make a thin apple sauce. Brown sugar rather than white sugar is ordinarily used. If a grape flavor is desired, it may be obtained by the use of grape juice in the proportion of one pound to each gallon of the peeled and sliced apple. There should also be added a cup of brown sugar and one-fourth teaspoonful salt. When the desired thickness is obtained, one teaspoonful cinnamon is stirred in.

Pear butter is made like apple butter without the cider.

Distributing Fertilizer

Not enough attention is paid on the average farm or orchard to the matter of securing distribution throughout the lower soil of the commercial fertilizers that are applied. A careful examination of orchard soils which have had water applied in furrows or basins for several years will show an accumulation of nitrates especially, just under the surface at the points where the water stood last. If certain trees happen to stand with roots close under these areas, they probably are thrifty; if a little farther away, they may be starving.

The trouble is due to the fact that the pore spaces of the soil are clogged enough to cause the earth to act as a filter. The water which seeps and percolates slowly downward and in other directions is robbed of the plant food dissolved in it. In time the clogging may continue till an actual cementing takes place, and the soil, though mellow and open when the trees were planted, actually may take a hardpan condition.

Aside from the matter of distribution of fertilizer, such soils give trouble in the application of water. They will not take water as rapidly as they should, nor will they hold a sufficient supply in capillary form to

Thirty-five Years of Experience Behind "Caterpillar" Tractor Construction

Always the right material in the right place—that is one reason for "Caterpillar" Tractor superiority, developed by thirty-five years of Holt experience. Some parts of the Tractor must be hard-surfaced, to resist wear. Other parts must be tough, to withstand vibration, or must possess other special qualities. Holt experience of three and a half decades has given the expert knowledge of design and construction that makes the "Caterpillar" Tractor the longest-lived, most efficient tractor built.

Efficiency, low operating expense, low upkeep costs—these "Caterpillar" Tractor features bring bigger profits to "Caterpillar" Tractor owners. The "Caterpillar" Tractor is a tractor service—built for service, backed by service. The investment in such a machine pays liberal returns.

Complete information concerning the "Caterpillar" Tractor sent on request.



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A Six Months Round Trip Ticket with Stopover Privileges
will enable you to visit all points of interest.

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Southern Pacific Lines

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Points to remember when consigning
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1.—We Specialize in Apples

2.—All Consignments Receive our
Personal Attention

3.—The Fruit is Sold by
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HOOD RIVER, OREGON

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4% Interest Paid in our Savings Department

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last between irrigation periods for normal soil. In fact, the two troubles are related that wherever it is seen that water sinks slowly, or that areas tend to dry out too quickly, it may be taken for granted that the undersoil lacks its due share of fertilizer.

The remedy is deep tillage. That, and that alone, will open up and crumble the soil enough to permit the penetration of water and the carrying down of whatever else may be applied to the surface. Many orchards throughout the Northwest have been blasted, but only at the points where the trees stand. The blasting should be done along the rows between the trees, at least one way, and well may be done over all the space between the trees. And those orchards which have not been heavily cover-cropped should be rebasted now. Roots of annual plants penetrating in masses to the lower soil will keep it open and fine for years, but if the breaking is not accompanied with cover-cropping, the original clogging and compacting may occur again soon.

No fruit trees will thrive properly on plant food they must secure from the top eight or ten inches of soil, no matter how much is put on there. They must be able to get it down where most of the feeding roots are located. Surface cultivation is a mild and ineffectual treatment at best. Provision should be made for filling the undersoil with irrigation water, and for making the water carry down the materials needed by the trees.—Contributed.

Potato "Don'ts"

Don't injure the selling and storing quality of your potatoes by careless digging.

Don't glut the fall market and injure your winter market by placing large quantities of ungraded stock on the market at harvesting time.

Don't ship any frost-damaged potatoes. It is disastrous.

Don't demoralize the already overburdened transportation facilities by shipping cull potatoes. Unless potatoes are extremely high in price, culls will not bring transportation charges.

Don't overlook the advantages of "machine sizers." They are proving of great value in many shipping sections.

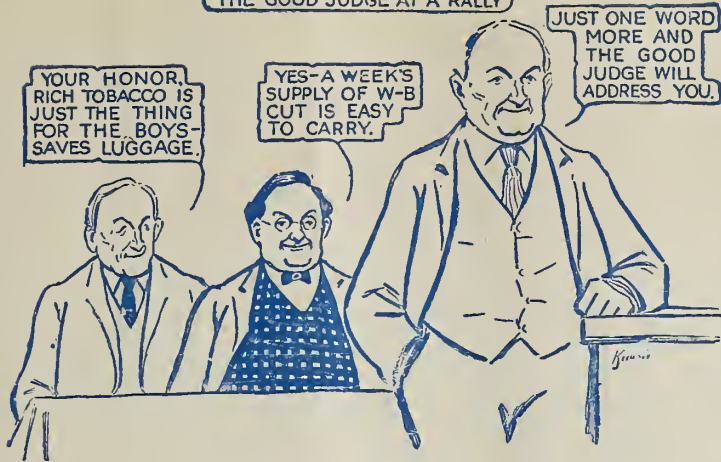
Don't expect machine sizers to grade for quality—only human hands can grade out the defective tubers.

Don't mix No. 1 and No. 2 grade potatoes. There are customers who desire each separately, but do not want them mixed.

Don't overlook the potato grades recommended by the United States Department of Agriculture and the United States Food Administration.

Farm boys should lay in plenty of nuts and popcorn. It's going to be patriotic to eat it instead of candy this winter.

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A MESSAGE

In conformity with the suggestion and at the request of the National
Food Administration under the direction of

MR. HERBERT C. HOOVER

ASSISTED BY

Messrs. G. Harold Powell and E. W. J. Hearty

IN THE FRUIT DIVISION

Steinhardt & Kelly NEW YORK

desire to advise the trade in general, and their out-of-town customers in particular, that their entire holdings of purchased apples and other fruits, will, during the duration of this war, be only sold within the limits of the Metropolitan district for consumption and use by the people of Greater New York.

Under no circumstances will we allow any of our salesmen to sell to speculators, our sincere intention being to get as close to the actual consumer as legitimate business tactics will permit.

Being unquestionably the largest holders of box apples in the country, it will be our earnest endeavor to keep prices on an even, equitable basis of values and we will permit no manipulation of our holdings that might tend to create abnormal prices.

To prove our sincerity at this critical time in our country's history, we will not, during the war, allow a single car of our holdings, no matter where stored, to be diverted from New York to other markets for speculative purposes.

The pyramiding of prices as practiced in some industries at this time is a crime against the nation of which we trust no firm in the fruit and produce trade will be guilty.

We feel certain that our stand in this matter will result in stabilizing values, thereby bringing fruits, which are so necessary and healthful, to consumers at a fair and reasonable price.

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